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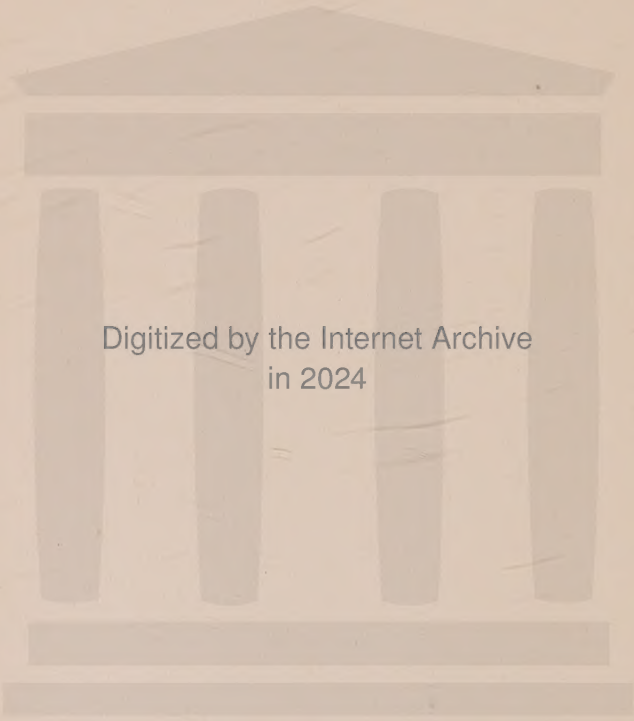
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OUTWITTING MIDDLE AGE

OUTWITTING MIDDLE AGE

BY

CARL RAMUS

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INTRODUCTION

Two themes now dominate civilized emotional life. One is Flaming Youth. The other is Rejuvenation. The one inspires and calls forth the other in inevitable sequence.

For the first time in history youth has largely broken away from the age-long control and restrictions imposed by parents, teachers, priests, and traditions. But the awakened Spirit of Youth has already found that the golden years of its unrestricted manifestation are too few for anything like full self-expression and satisfaction. Furthermore it has found that the keenest appreciation of the restless activity and powers of youth does not come until youth itself is in its passing. "Alas! that Spring should vanish with the rose!" say most of them, and resign themselves to what they believe to be the inevitable. But others there are and always have been who rebel at what seems nature's cruel and wasteful arrangement, and these strive to prolong a glorious youth and to hold back a hateful middle age.

It is due to the ceaseless pressure of this Spirit of Eternal Youth that many daring scientists, from the alchemists of the Middle Ages to their modern representa-

tives, have doubted whether youth was necessarily as short-lived as common experience makes it. From these labors of centuries has come at last the momentous discovery that the aging process which so soon depreciates and mars human bodies is not Divine Dispensation or Natural Necessity but a *chronic disease*, whose cause is a combination of bad habits. Regarding aging then as a disease comparable with several chronic diseases which produce similar effects, it follows that the aging process must be subject to the universal law of cause and effect. Admitting this, the proposition as to aging is then exactly the same as toward any other disease; namely, remove the causes, and the effects cannot come.

At the present writing, most, if not all, the causes of aging seem to have been clearly worked out. Most important of all, every one of these known causes is found to be *preventable*, as are the causes of cholera and yellow fever.

A fact long known to science is that most of the living tissue cells of our bodies are constantly wearing out and being replaced by new ones. Western physiologists are still in doubt whether this is true also of some of the higher functional tissues—such as the kidney and liver cells and those of the brain and nervous systems. Some Indian scientists, however, maintain that all human tissue is entirely renewed within seven years. If this is so, it means that every human body is actually a *new body* every seven years; and moreover that if our bodies could be protected from the conditions

which we know gradually bring about aging, they could live on indefinitely, barring accidents, in changeless youth and strength.

By natural analogy, however, it would appear that no human or other body could be expected to live forever, even if all the secrets of life were known to science. Probably "all things have a certain time during which they exist on earth," as Paracelsus wrote. But that "certain time" may be very long—far longer than any one would dare to hope for as yet. The great Metchnikoff believed that life could be indefinitely prolonged if the problem of intestinal autointoxication could be solved. That problem appears to have been virtually solved recently by some of his followers—Torrey, Rettger, Cheplin, and others. Steinach and Voronoff seem to have rejuvenated senile animals and men by surgical means. Edison sees the two-hundred-year man as a probable result of the science of the immediate future.

The medical profession as a body, however, is still very skeptical toward procedures aiming greatly to prolong youth or to rejuvenate the aging. But this need not be taken as discouraging. The history of medicine and science teems with records of organized opposition to new and revolutionary developments. The accepted medical and scientific attitude toward such things has always had and always will have three stages. First, it ignores them. Secondly, it becomes sarcastic and irritated about them. Thirdly, it accepts

them and forgets that it has not always done so. But this organized resistiveness to new things works also for good, in that it warns and protects, so far as it can, a helpless laity against venereal and other advertising medical crooks whom the law blindly licenses and places on *legal* equality with decent doctors.

Let us be warned, however, by the mistakes of our scientific past and try to be open-minded but not credulous toward this great question of prevention and cure of middle age, remembering that the present advancement of science admonishes us against defining limits to possible human longevity, and more and more supports the words of Seneca written two thousand years ago: "Man does not die; he kills himself."

As I have the honor to be an officer of the United States Public Health Service, I must here emphasize the fact that any theories or comments in this book which may appear to diverge from generally accepted medical and scientific opinion are expressions of personal opinion only and not in any sense official statements.

Some excellent books are on sale, but for the most part they are too technical and too large for general reading; and moreover no one of them covers all parts of the subject. This book summarizes the actual progress made up to date in every direction—physical, psychological, medical, and surgical. It contains the boiled-down practical part of many large technical works and medical and surgical reports, also historical

records, with references so that the original sources may easily be found and studied as deeply as desired.

The parts of this book for which some originality is claimed are found mostly in the chapters dealing with the psychology of aging. Such in particular is the chapter on the climacteric, which carries a new message of hope to all women who are approaching that dreary mile-stone of feminine existence.

In sum: a reading of this book will materially change every mature person's outlook on life by showing that the boggy of middle age, if resolutely faced, *can* be driven forward into a receding future whose extent in years no one can gage at the present time.

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All things have a certain time during which they exist on the earth. If a man's time to stay is over, he will have to die. But many die before their time is over, not by a visitation of Providence, but because they are ignorant of the laws controlling their nature.

PARACELSUS.

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CHAPTER I

THE QUEST FOR PROLONGED YOUTH

Until within a few years ago the brightest future that any one could look forward to was always darkened by the grim shadow of Age—"Age," as Aphrodite, Queen of Love, said to Odysseus, "that is pitiless, and ruinous, and weary, and weak—age that cometh on all men, and that is hateful to the Gods."

What bitter irony that after years of varied experiences have expanded and enriched a personality, when judgment and discrimination have in a measure been attained, when one has at last learned to view life in a truer perspective, when men and women and things and relationships and realities are seen with clearer vision—when, in sum, Life's lessons have been largely learned—that by that time one's body has passed its prime and is no longer an efficient instru-

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ment for study, for work, for service, or for enjoyment!

Before modern scientists began seriously to study the causes of aging as they do the causes of diseases, almost every one, even those having scientific training, accepted without thought or question the brute fact that age must come at about the height of one's learning and experience. A wasteful and stupid arrangement of nature, it seemed, to put bodies out of business just about when minds had become best trained. But then—it was the common lot—the inevitable!—so why complain when complaint would be futile and unphilosophical? A natural sequence of such an attitude would sometimes bring the pessimistic thought: Is the enormous effort to acquire knowledge and develop efficiency worth while when the time left for useful application is so short and so handicapped by advancing senile depreciation? Is the game worth the candle? And well indeed might they, a few years back, have echoed Faust's lament at the uselessness of learning when conditioned by aging and soon ended by death.

It was this shrinking dread of golden youth and mature manhood from the common fate that led the medieval alchemists to include with their search for the philosopher's stone the quest for the elixir of life. The alchemical writings of that period are full of references to such an elixir. In modern fiction, though now seldom read, the subject has been handled in masterly style by Bulwer-Lytton in "Zanoni" and "A

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Strange Story." In our own day Gertrude Atherton's remarkable book, "Black Oxen," long held the first place as the best written and best selling book with that theme for its *Leitmotif*.

Among the curious records left from earlier centuries is that of Lésebure, a physician of the court of Louis XIV. He narrates some marvelous experiments he witnessed with a certain secret rejuvenating medicine. It was first tried on an old hen. After two weeks her feathers fell out and a beautiful new crop came in. Her comb stood up again, and she began laying eggs once more. The next subject was a woman of seventy. After taking the medicine about ten days she began to menstruate, and then became so frightened that she refused to go on with the experiment. The alchemist then began taking the medicine himself. Within two weeks his hair and nails began to fall out—when he, like the old woman, lost courage and did not continue the marvelous experiment.

Whatever may be the facts behind Lésebure's narrative, there are a number of apparently authentic instances of men and women who lived to ages far beyond one hundred years, and yet whose bodies long retained the appearance characteristic of the prime of life. Such is the famous case of Thomas Parr, who lived to the age of 152 years, and still looked like a well preserved man of about forty-five when 130. One can easily imagine the feelings of the community growing gradually into awe as this man lived decade after decade,

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score after score, in almost unchanging youth, while his contemporaries lived and aged and died as old men, and after them their children, and *their* children, and yet *their* children, generation after generation, going through the common cycle of youth, middle age, senility, and death. More will be said about Parr in a later chapter.

The Modern Quest for Prolonged Youth: Brown-Séquard. The pioneer worker and discoverer in the treatment of aging was Dr. Brown-Séquard, professor of physiology first at Harvard and later in the University of Paris. About thirty years ago he startled the middle-aged world by announcing that extracts of the sexual glands of certain animals, when injected into aging human bodies, brought about marked abatement of symptoms of senility, with a corresponding improvement in all functional activities which seemed to be nothing less than rejuvenation. Then an old man of seventy-two he found himself invested with an amount of nervous energy that enabled him to run and jump as in his prime. All his functions quickened, and his mental power was greatly increased.

As might have been expected of any discovery so revolutionary, Brown-Séquard's statements were jeered at by the all-wise leaders of the science of his time. But it is now recognized that to him more than to anyone else is it due that there is now a serious and scientific treatment of aging and its causes. Before

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him no one with anything of an education would have dared to think—much less to suggest—that aging was not either a dispensation of Providence or a law of Nature, against which any attempt at prevention or cure would be not only futile but impious.

It turned out, however, that although Brown-Séquard's work was to some extent confirmed by others, it did not by itself seem to stand the test of time and experience, and after a while it ceased to attract attention. But the record of what he had done remained and served to inspire younger men of like imagination and vision to continue the studies he had begun.

Metchnikoff. Before Metchnikoff turned his attention to the causes of aging he was already famous for his discoveries in bacteriology and for his original theories regarding immunity against infectious diseases and the functions of the white corpuscles of the blood. He was a Russian and formerly held the chair of zoölogy at Odessa. Afterward he went to Paris and became subdirector of the Pasteur Institute. He was one of the first to discover the responsibility of intestinal autointoxication as a factor in causing the physical changes that go with the aging process. He also directed attention to the beneficent action of certain ferments formed in milk as counteracting agents against autointoxication from intestinal putrefaction. These will be taken up in detail in the chapter on diet.

After reading the evidence now accumulated from

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many sources, much of which appears to be reliable, it is difficult to avoid the conclusion that, in certain cases and in certain hands, modern medicine and surgery have apparently rejuvenated old men and old animals. Anatomical and physiological difficulties that were believed to be insurmountable a generation ago seem now to have been overcome. Much more will be said about this part of the aging problem in other chapters. In particular we shall look in some detail at the seemingly epoch-making work of some of Brown-Séquard's followers.

The so-called gland operation is still very much talked about and perhaps still more thought about. It consists of transplantation of the sexual glands of apes, or of young men killed by accident, into the bodies of aging men. It would even appear that some brainless young men have actually sold their glands to high bidders. The publicity given the subject in the newspapers soon attracted the attention of the underworld, and several cases of gland-snatching are said to have occurred—young men having been waylaid, taken to some secret operating-room, and chloroformed, awaking some hours afterward minus their glands. In the Chicago trial of Loeb and Leopold for the murder of the Franks boy, it developed that the pair had indulged in this crime for mere pastime at least once. As might be expected, many elderly or pre-senile men are secretly trying this operation, in the pathetic hope of finding rejuvenation or at least a kind of Indian sum-

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mer period of renewed youth and masculine vigor.

Whatever may have been behind the claims of the medieval alchemists, and whatever the successes of modern surgery and medicine in prolonging youth, I shall now refer to cases which have come under my own observation, and which, although not so spectacular as the others, have for most of us a far more practical value as object-lessons; for they demonstrate that there is now a means available to all of us which can to a considerable extent remove the ravages of acquired old age, and, better still, postpone its onset for many valuable years, if not indefinitely.

The first case is that of a physical trainer, a Frenchman, who was seventy-one years old when I last saw him eleven years ago, and who looked about forty-five. He was a gigantic man, a modern Hercules of prodigious strength. He could remain as many as eight hours a day in salt water, giving swimming-lessons. His exceptional strength and agility may be realized from reference to an experience he had one Saturday night when he was attacked by six half-drunken soldiers. He knocked them down, one after another, and then ran several blocks until he had out-distanced another crowd that came to the rescue of the first six. He had spent the most of his life out of doors and at athletics.

My second case was a prominent business man of fifty-nine. Most of his latter years had been spent in a swivel-chair in his office. He took no exercise. He

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ate luxuriously and immoderately and drank more than was good for him. His body was flabby and unwholesome, and he had acquired a pendulous abdomen and looked old. He suffered from severe indigestion, constipation, headaches, and heart-flutterings, and had developed into a typical neurasthenic, going from one expensive doctor to another. At one time he was actually taking medicine from three doctors simultaneously, without telling any one of them about the other two.

One day an old friend had the courage to tell him that his whole trouble was due to overeating, lack of exercise, and excess of medicines, and that he would get well if he limited himself to five dollars a day and *earned* it. The blunt advice must have come at a true psychological moment, for he at once put himself into the hands of a trainer, and, most remarkable of all, stuck to the trainer's program.

When I saw this man again about five months later I did not at first recognize him. The look of old age was gone. The belly was gone. All his former distressing symptoms were gone, and he moved and acted, swam and dived, almost like a young man. He had acquired the *habit* of daily physical exercise, and he now loved and looked forward to spending the latter part of every afternoon at the boat-club. He assured me that he felt himself a new man in every way.

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The well known case of Sanford Bennett is much like the two I have just described. He attracted nationwide attention when his book, "Old Age; Its Cause and Prevention," appeared in 1912. But as popular memory is always short-lived, a brief reference to Bennett's case will be apropos here. When Bennett became fifty he says he was already an old man, and his picture taken at that age supports his statement. He was then wrinkled, partially bald, cheeks sunken, face drawn and haggard, muscles atrophied, and he had had chronic dyspepsia and rheumatism for many years. The desperateness of his case and a strong desire to live impelled him to take up a course of systematic physical culture, which, after some time and a great deal of hard work, wrought what might well be called a miracle, when compared with ordinary experience. Twenty-two years later, when he was seventy-two, or at man's orthodox age limit according to the ninetieth Psalm, he was an athlete, in perfect health, without wrinkles, with a new growth of hair, and looking not much more than half his age in years. His body had actually grown many years younger.

What Bennett has done, almost any one else with will-power can do, if he is not then too old, or definitely a victim of some progressive constitutional disease of middle age. My own observation absolutely confirms him when he says, "The solution of the problem lies only in Nature's principal methods of inducing health

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—sunlight, pure air, pure water, nourishing food, cleanliness, and exercise.”

These three examples demonstrate the constructive value of physical exercise from two different positions. The first shows it to be a definite preserver of youth and strength, with the pushing of middle age always farther forward into a distant future. The second two show the power of physical exercise actually to restore, to a large extent, one's lost youth and vitality, even after many years of unhygienic living and the advent of old age itself.

Thanks to the wide interest in physical culture in recent years, similar cases are now occurring every day. Why, then, do many men not yet old submit themselves to problematical expensive gland operations when there is already a more natural way which is surer and safer? For one thing, because many such men have become physically too inert to take the trouble involved in physical exercise. For another thing, because such men are not interested in athletics and never read anything about them, and they do not know that scientific physical training, without a teacher and without expense, can get results in restoring youth and “lost vigor” that compare favorably with the best of those claimed for gland operations.

At this point I should give the warning that what has been said in the preceding paragraph is not intended to disparage surgery in this connection. There is now evidence showing that in certain cases and, above all,

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at the hands of certain surgeons, remarkable results have been obtained. This will be discussed in the chapter on surgical operations.

It should be clearly realized that youth and youthful appearance are fundamentally the same and depend physically on perfect circulation. Circulation depends on the elasticity of the blood-vessels, and the state of the tissues of the blood-vessels depends on the *quality* of the substances introduced into the blood through the intestines; and that in its turn depends on the manner in which the digestive process functions.

Lack of exercise brings constipation, and that interferes with the elimination of poisons and forces some of them to back up into the circulating blood. These poisons irritate the lining of the arteries and cause them gradually to harden and diminish in caliber until many of the smallest ones become blocked up and finally obliterated. And then the physical basis of aging has its beginning. We often see men of forty whose bodies are already old, and on the other hand men of sixty to seventy who are not yet old and not yet past their prime.

In sum, aging is not so much a matter of years as of defective circulation. Sane physical exercise and simple food prevent constipation, favor elimination, and maintain good circulation. That which maintains good circulation conserves youth. To a very large extent then, a true elixir of life is thus available to every one, man and woman.

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And yet even physical exercise, to be enduringly effective, must have a background of constructive thought and emotion habits. That exceedingly important part of the aging problem will be taken up in the chapters dealing with its psychology.

CHAPTER II

CAUSES AND CONDITIONS

In the first chapter it was shown in a general way how the preservation of youth and the postponement of the signs of middle age depended largely on maintaining good circulation of the blood; how such good circulation could be kept up indefinitely by regular and sane physical exercise and simple correct diet; and how such means could even restore, to an extent, one's lost youth, looks, and strength after years of unhygienic living and the actual onset of old age. In the present chapter it will first be shown what aging is, physically and chemically, and then how the resulting tissue changes may be caused.

What Aging Is. The physical tissue changes which go with aging, in addition to the familiar and obvious changes in personal appearance, are, broadly speaking, two. These consist, first of a generalized *fibrosis*, which means, in plain English, the gradual overgrowth of the lower grade fibrous connective tissue, which is, so to say, the structural framework of the body, at the expense of the vital functional tissues. Fibrosis is always preceded by *irritation*, due to repeated introduction of poisonous substances into the blood.

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The second destructive change consists of a gradual *precipitation* of insoluble mineral matter within the tissues of the body. The precipitation begins first in the walls of the arteries, gradually diminishing their elasticity and caliber and the nourishment of the tissues they supply. As a consequence of these two destructive changes, all functional activities slow down more and more, until some vital organ stops altogether, when death occurs from old age.

How Aging Comes. It has long been known that tissue changes similar to those of aging may be caused by the long-continued presence in the blood of (1) the poisons of certain chronic diseases such as syphilis, gout, and rheumatism; and (2) poisonous drugs, such as alcohol, lead, and tobacco. More recent studies have added to these (3) exhaustion from continuous excessive work, and (4) autointoxication from poisons produced in the intestines. The common intestinal conditions from which poisons develop are four in number: Chronic indigestion, chronic constipation, intestinal putrefaction, and certain intestinal parasites.

Abnormal Deposits. These are insoluble calcium salts precipitated from the blood. The normal formation of bone is a process of precipitation of calcium salts in the molds set by nature. The abnormal precipitation which occurs in certain diseases and in aging is actually the same process, in less degree, but in localities where calcium deposits do not belong. To quote from

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an authority: "Calcium is carried in the blood in amounts not far from saturation point, held in solution by the colloids and the carbon dioxide. This unstable double salt of calcium bicarbonate and dicalcium phosphate is absorbed in the hyaline matrix [devitalized tissue] and precipitated by a reduction in the quantity of carbon dioxide." ¹

Colloids, by the way, are substances like solutions of starch or mucilage, which, though unstable themselves, have the peculiar property of holding certain salts in solutions that are barely over the borderline from particles in suspension. Colloids are of special interest to chemists and physicists because they have molecules so large that some of them have actually been seen through the ultramicroscope. "Because of the rather slender margin by which the colloids are separated from the suspensions, their persistence in solution is generally in rather a precarious condition. Relatively slight changes suffice to throw the colloids out of solution, and when once precipitated, they are often incapable of again dissolving in the same solvent." ² Quoting once more from MacCallum: "With advancing age, and probably in association with such conditions as bring about calcification of the blood vessels, we find the calcification of such cartilages as the costal [of the ribs] and tracheal [wind-

¹ MacCallum, "Text Book of Pathology," III.

² Wells, "Chemical Pathology," p. 408.

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pipe], which ordinarily remain free from this substance.”³

In conclusion, as to abnormal deposits, calcium normally exists in the blood in an unstable condition and near the saturation-point. Apparently when quantities of poisonous substances—such as the products of intestinal putrefaction, certain meat extractives, and specific disease toxins—are thrown into the blood, its colloid equilibrium is disturbed, and calcium is then abnormally precipitated. After the poisons have been neutralized and eliminated, some of the precipitated calcium may be redissolved, but a part of it probably remains in the meshes of the tissues that are already more or less devitalized by previous gradual auto-intoxication. Such deposited particles then tend to become centers around which others settle. It is probable that precipitation is always preceded by irritation and some degree of fibrosis.

Chronic Indigestion. In chronic indigestion from any cause the digestive fluids may be produced as to bulk, but their chemical characters are so modified that they incompletely digest the food and produce from it substances which irritate the intestinal walls. If the irritation lasts long enough it may cause ulcers in the stomach or in the upper part of the intestines. When ulcers last a long time and are daily irritated by abnormal digestive fluids they may develop into cancers,

³ “Text Book of Pathology,” p. 108.

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which will kill if they are not removed surgically in their early stages.

Chronic Constipation. Chronic constipation often accompanies chronic indigestion. Normally the intestinal refuse is eliminated before the poisonous products of bacterial action have time to form in any amount. But in constipation the retained refuse becomes a culture medium, a septic tank of bacterial poisons, which the lower intestine automatically absorbs and passes into the blood. These poisons join with those of chronic indigestion in irritating the lining membrane of the blood-vessels and the functional tissues, and in precipitating within their substance the insoluble deposits which clog their functional activities and progressively destroy them.

Under the combined destructive influences of chronic irritation, gradual precipitation, and progressive fibrosis, the arteries become less and less elastic and smaller in caliber. The functional activities of the vital organs diminish. The hair begins to turn gray or to fall out. The smooth elastic skin of youth commences to dry, to wrinkle, and to get flabby. The eyesight fails, the hearing fails, the memory becomes poorer, the bladder contracts more and more slowly, the sexual power wanes, change of life comes and goes—and the dreary course of old age is definitely under way.

Short Cuts to Senility. Certain diseases, such as syphilis, gout, rheumatism, and alcoholism, hasten

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aging in that they greatly augment fibrosis and precipitation within the vital tissues. Syphilis has particular affinity for the walls of the blood-vessels—the arteries—and for the nerve tissues of the brain and spinal cord. Its remote effects are often found in hard arteries, which under the beat of the pulse feel like pieces of wire. In some advanced cases the deposits in the walls of the large arteries develop into thick, almost bony tubes. Syphilis is also responsible for locomotor ataxia, for most cases of apoplexy, and for the numberless cases of general paralysis of the insane which fill to overflowing the state institutions.

Chronic autointoxication from the alimentary canal is becoming more and more regarded as responsible for the so-called constitutional diseases that so often come on about middle life, and which are themselves to some extent senile symptoms. “That long-continued intoxication of intestinal origin may cause serious injury to the tissues is extremely probable,” says Wells. “There is much reason for believing that many cases of non-alcoholic cirrhosis are due to this cause; not improbably chronic nephritis, myocarditis, and arteriosclerosis may occasionally be the result of long-continued intoxication from this source.”⁴

Exhaustion. Excessive and long-continued overwork produces a tissue poison which is a frequent cause of premature aging, especially in women. For

⁴ “Chemical Pathology,” p. 587.

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example, young Italian peasant women often have considerable beauty. But at thirty, after marriage, large families, and excessive hard work, their youth and good looks are gone and their faces are lined. At thirty-five they look middle-aged, and at forty they are hags. In our own land it is recognized that farmers' wives generally age quickly and die early. Not seldom it comes about that the results of the thrift and sacrifice of such devoted wives and mothers are in the end enjoyed by second wives.

Contrast with these prematurely worn-out women the familiar examples of famous actresses and singers, whose lives, while sometimes intemperate, are free from sordid stress, over-breeding, and deadly dullness; whose health and comfort are solicitously and most carefully watched over. At fifty they are often still beautiful and personally magnetic.

Stages in Aging. The beginning of precipitation and the hardening of the arteries are the first stage of old age, irrespective of the number of years. Hence the familiar phrase, "A man is as old as his arteries." The second stage of old age is especially characterized by abnormal growth of the framework tissue of the body. By a curious anomaly the substances which are poisonous to higher functional tissues become *stimulants* to the lower-grade but coarser and stronger fibrous tissue framework. This morbid stimulation causes a gradual overgrowth of fibrous tissue at the expense of the higher tissues, slowly choking them

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out, as delicate garden-flowers are choked out by weeds.

Physical Analogies. When we compare bodies that function well with bodies in states of aging, we find that they have some analogies with the comparison between fires in well kept stoves and fires in neglected stoves whose drafts are choked with ashes. Neglected stoves can easily be cleaned, however, while neglected choked-up bodies take much more time for their cleaning out, because the ashes with which they are choked have become a part of the substance of the bodies. A very old and choked-up body is therefore incapable of being cleaned out entirely, though even when in that state something can now be done, and perhaps much more as knowledge increases. The great admonition in all this to those who are not yet too old is: do not let any more ashes accumulate in your stoves—which means mostly deposits in the walls of your arteries. You know enough now to put a stop to that if you want to, and if you have the will-power.

Preventable Physical Causes. Obviously the chronic diseases, the poisonous drugs and chemicals, physical exhaustion, and intestinal parasites all come more or less under the head of preventable causes of aging. There remain to be accounted for, then, as far as present knowledge goes, only three other definite physical sources of poisons which can continuously pollute the blood stream and interfere with nutrition, namely: chronic indigestion, chronic constipation, and intestinal putrefaction. To what extent are these preventable?

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Almost entirely by changing one's habits. Even when due to poverty and its enforced privations and unhygienic conditions of living, they are still potentially preventable.

CHAPTER III

THE GLANDULAR SECRETIONS.

Modern researches into the causes of aging have definitely ascertained that the normal activities of certain glands are essential to physical and mental well-being and to youth and strength. Conversely in senility and certain diseases which imitate some of its tissue changes, these glands are almost always found to be either degenerated or not functioning properly.

The glands that appear to be of foremost importance in this connection are the sexual glands of both sexes—the testes and ovaries, sometimes called the gonads. It has been demonstrated that in addition to the obvious spermatic and ovarian secretions, both sets of glands form other secretions that do not escape through the ducts but enter the blood and diffuse themselves throughout the body. These so-called internal secretions have a profound influence on the form and appearance of the body, and on the mind and emotions. The proof of this is as follows:

When these glands are lost or destroyed in infancy, by disease or castration, the subsequent development

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of the body does not proceed along normal lines. Instead, children of either sex grow up with bodies that are neither male nor female in type, but something of a cross between the two. A male child will eventually have a body with rather wide hips, large breasts, hairless face, infantile sex organs, a peculiar wrinkling of the corners of the mouth, and a high-pitched voice. A female child thus castrated will develop a body of the same type as the castrated male. When they reach adult age both will look much older than they are, and both will have a tendency to accumulate fat, especially on the hips, abdomen, and breasts. Their mentality will usually be below par, and their emotional natures will be undeveloped.

Biedl says: ¹

The influence of the internal secretion of the generative glands is not confined to the development of the secondary somatic sex characteristics, but has a far-reaching effect upon a large number of organs and upon the general metabolism. The profound influence which this hormone [internal secretion] has upon the organism is apparently independent of sex, and is thus not specific to the male or the female genital gland.

L. L. Stanley injected crushed testicular substance in a series of one thousand cases, many of them badly run-down patients who were under weight, lacking in energy and appetite, and with insomnia. He found

¹ "Internal Secretary Organs," 1913.

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that "Usually within the first week after the treatment they gain in weight, have increased appetite, and evince general buoyancy." ²

In a remarkable case reported by Voronoff ³ a boy of nine years of age had a full beard and mustache, hair on chest and legs, and the facial appearance and mental development of an adult. One sex gland was abnormally large, probably from a tumor. Voronoff removed the abnormal gland, and after several months the beard and the hair on the body disappeared, and the boy's mental precocity diminished to about the average normal for his age. In this case the intensified sexual characters were due to a mass of sexual glandular tissue whose growth had escaped from the normal physiological control. The case has a strong analogy with an equally interesting one where thyroid tissue was involved, and which will be referred to when we come to the thyroid gland.

In the aged who look old, there is a striking parallel between their appearance and that of young persons having undeveloped sex glands or who have been castrated. There is often the same wrinkling of the face, tendency to fat, high-pitched voice, and impaired mentality and emotional nature.

Moreover the sex glands of all obviously senile persons are found to be shrunken and not functioning

² "An Analysis of 1000 Testicular Substance Implantations," "Endocrinology," Vol. VI, November, 1922.

³ "Scientific American," October, 1925.

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actively. In the sexual glands therefore we have centers of chemical activity which have definite relations with youth and with old age. A final proof of this is the clinical one that is furnished by many unfortunate women who were and are victims of the frenzied and sadistic surgery of some twenty years ago, which recklessly removed ovaries from almost every woman who was unlucky enough to fall into the hands of so-called gynecologists. After such unsexing operations the victims sooner or later developed a premature menopause, with the usual wretched symptoms, but followed by complete sexual frigidity and premature old looks. It has been found that when animal ovarian extracts are fed to these one-time women, they soon brighten up mentally and emotionally, and their look of premature age becomes somewhat softened.

Furthermore it has also been shown that when extracts of the testes of animals are given to aging men, there is often a marked, though temporary, improvement, physically and mentally. The pioneer savant in this field was Dr. Brown-Séquard, to whose work reference is made in Chapter I.

Thyroid Gland. Fully as important as the influence of the internal secretion of the sexual glands, however, seems to be that of the thyroid gland. This gland is entirely ductless, but its internal secretion finds its way into the blood. Iodine is the main constituent of its secretion. The far-reaching influence of the thyroid gland secretion is shown by the following facts:

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Where the gland is congenitally absent, children are cretins—physical and mental defectives. When the thyroid gland is removed or destroyed in mature life, the person develops myxedema; that is, a complex of fatty development, wrinkles, impairment of all functions, impotence, mental and emotional deterioration, and—if not artificially relieved—death. But when such persons, with the premature symptoms of advanced age, are fed with thyroid extract, they quickly regain their youthful looks and functional activities and mental and emotional balance—and keep them, so long as they take thyroid extract regularly.

The iodine content of the thyroid secretion causes it to maintain the normal degree of fluidity of the blood, and thus to assist circulation, nutrition, and elimination. It also has much to do with neutralizing the poisons absorbed by the blood from the intestines, resulting from impaired digestion and chronic constipation. This last function is of supreme importance in delaying the onset of senile changes, and coöperates with the liver in this respect.

Ordinary goiter, such as we so often see in young girls, is a sign that the thyroid gland is not getting enough iodine to make the normal amount of internal secretion. The gland itself then works overtime in a blind effort to do its appointed task. When a small amount of iodine is given daily for some time, these neck swellings disappear.⁴ Formerly entire commun-

⁴ See Reports of the U. S. Public Health Service.

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ities in Switzerland used to have goiter. Now since science has found the reason for most cases of goiter to be deficiency of iodine in food or water, goiter has nearly disappeared from Switzerland.

In one case at least it has been proved that the internal secretive power of the thyroid gland cells was retained even after cancerous degeneration had set in. This case developed a cancer in the thyroid gland. To the surgeons it seemed a case of Hobson's choice whether to let the patient die of cancer in a few months or to remove the entire thyroid gland and then wait for the occurrence of myxedema. But operation was decided on, and the cancerous gland was removed. Soon after the operation the dreaded symptoms began to appear. The patient rapidly deteriorated, physically and mentally, when, to the astonishment of the medical men, improvement set in, and the normal status was soon regained. A little later, however, the mystery was sadly accounted for. Another cancer was growing in a distant part of the body. This second cancer caused death later, and when at the necropsy it was removed and examined under the microscope it was found to consist of thyroid cells that had become cancerous. The strange fact shown by this remarkable case, that a malignant tumor could temporarily carry on the functions of an important gland, may some day point the way to the discovery of the cause of cancer—and with the cause, perhaps later the cure.

Another fact of much significance is that abnormal

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changes in the thyroid gland are usually accompanied by similar changes in the ovaries and testes. Goiter has been observed to occur after castration, and degenerative changes in the ovaries have followed the removal of the thyroid gland.

Removal of the thyroid is also followed, first by excess of fat, and later by its disappearance and an overgrowth of connective tissue. Old age first gives a tendency to considerable excess of fat, and, much later, the disappearance of fat and drying up of the entire body, with overgrowth of connective tissue.

Here we find another striking parallel between the effects of removal or extensive destruction of the thyroid gland and of old age. But in thyroid disturbance the changes take place quickly, while in aging they come much more slowly. Still another parallel is that impotence is present in thyroid destruction in young persons, as it is in old age.

Obesity. Abnormal fatness often occurs with the onset of senile changes about middle life. According to Lorand there are two kinds of obesity: one caused by overfeeding and lack of exercise; the other due to disturbances or diseases of one or more of the ductless glands, usually the thyroid or sex glands. He gives us a rule for distinguishing the two, as follows: (1) People who are fat from overeating are often red in the face and have a full-blooded look. They are easily overheated, perspire freely, and as a rule are not subject to constipation. (2) Fatness from glandular dis-

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turbances generally give pallor, with cold and dry skin, and constipation.

Adrenal Glands. The adrenals are two small glands, one above each kidney. They are ductless and secrete a very powerful and important substance called adrenalin. This substance has several known functions. One is to maintain a normal blood-pressure. Another is to neutralize the poisonous products of metabolism, especially of muscular action. It also contributes largely in the destruction of the toxins of infectious diseases and of other poisons, such as excess of phosphorus, mercury, arsenic, alcohol, and tobacco. It is probable that the adrenals produce the protective antitoxins.

Experiments on animals have proved that the adrenal secretion is an antidote to many poisonous substances. For example, when animals whose adrenals had been removed were given injections of poisons they would die quickly; but when adrenal extract was given with the poisons, they would live much longer, sometimes indefinitely.

It has also been proved that the adrenals can be seriously and even permanently injured by continuous poisoning, such as from alcohol, nicotine, excess of meat diet, and intestinal autointoxication.

The rare disease called Addison's disease is due to definite damage of the adrenals, often by tuberculosis. The main symptoms are: (1) bronzing of the skin; (2) intense weakness; (3) gastro-intestinal disturb-

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ances; and (4) emaciation, except for the lower abdomen, which may have a deposit of fat.

The disease arteriosclerosis, or hardening of arteries—which might, indeed, be called senility!—has a definite relation to the state of the adrenals. When these are functioning normally they help to destroy all the poisonous substances that get into the blood, and maintain normal blood-pressure. But when they are diseased, or when constantly stimulated to overproduction, arteriosclerosis may develop. Thus experimental arteriosclerosis has been produced by injections of adrenalin, and also by alcohol and nicotine.

Another influence which is now definitely known to affect seriously the functioning of the adrenals is emotional stress from sustained worry, grief, anxiety, fear, and anger.

To summarize the facts that we should remember about the adrenals: their overactivity, when stimulated by the poisons of chronic constipation, excess of meat diet, alcohol, and tobacco, tends to bring about arteriosclerosis, which is the definite beginning of the aging process.

Pituitary Gland. The pituitary gland rests at the base of the brain and near the center of the head. It has some remarkable functional analogies with the sexual glands. Disease of the pituitary causes the same look of premature age which is present in castrated individuals of both sexes, and often impotence. The rare disease acromegaly, or gigantism, is due to disease

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of the pituitary gland. In this disease, parts of the body, or the entire body, seem to get beyond the physiological restraint which normally keeps a body or any of its parts from growing abnormally. Such overgrown bodies do not express strength but weakness. I saw a giant nearly seven feet tall at the Ellis Island Immigration Station in 1922. Physical tests showed him to be actually feeble. His gigantic frame was so loosely put together that he had curvature of the spine from sagging of the vertebral column. Another case of extreme gigantism almost nine feet tall was so weak that he could not walk unless supported by a man on each side of him. In spite of his enormous height his face looked like the face of a child.

In advanced disease of the pituitary gland, according to Frankel, there have been observed blindness, complete impotence, paralysis, and finally imbecility.

Here then is another ductless gland, about as large as a hazel-nut, which has a profound influence on the bodily form, on the sexual system, and on the mental and emotional status. In the few cases of the very uncommon disease acromegaly in which the pituitary gland was examined after death, it was found to be diseased. But the obvious fact that gigantism is so rare, and that the overwhelming majority of people do not show any trace of it, suggests that only very rarely is the pituitary sufficiently diseased to figure much in the direct causation of the common senile changes. An extract of this gland is now much used in surgery for

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arresting hemorrhage after certain operations and after childbirth.

Some very recent experiments with pituitary extract by Evans of the University of California are said to have produced in rats abnormal though symmetrical growth to an astonishing extent, some of the animals having attained sizes far in excess of the average normal for the species. We shall await with interest the reports on the effects of pituitin on stunted children and adults.

Summary. In taking stock of what is now known about the internal secretions (endocrines), it seems to be evident that there is something of a system of co-operation between the several glands. To some extent one gland can help out another, and temporarily it may even partially assume its functions. Thus the thyroid and sexual glands (gonads) act much the same in preventing pre-senile deposits of fat and in preventing older looks. The adrenals coöperate with the thyroid in destroying the poisons of certain diseases. The present attitude of physiologists is summed up by Lewellys F. Barker as follows:

The conception that the endocrine organs are linked together so as to form a system of reciprocally dependent organs [hormonopoietic system] has gradually gained general credence, not only among clinicians, but also among physiologists and pathologists, and it must be admitted that there is considerable evidence in favor of the existence of such a correlative interdependence among

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the several incretory glands. Physiologists, through their experiments, have adduced many facts that point to manifold interrelationships between the glands of internal secretion.

There is now much very interesting information about other ductless glands—the parathyroids and thymus, and also of the mysterious internal secretion of the pancreas which controls sugar absorption and prevents diabetes—now happily isolated and available for sufferers under the name of insulin. Those interested can read all this in detail in the works of Lorand, Sajous, and others. While these important glands probably coöperate with every other gland in attending to the upkeep of the body as a whole, and deteriorate like all else in the course of senility, their bearing on it is not so obvious as is that of the sexual and thyroid glands, and it would be out of proportion to spend more time on them in a book which is mainly intended to set forth the practical side of the study of aging. But those who find their interest stimulated to further reading would do well to read what Lorand, Sajous, and others have to say about these glands.

CHAPTER IV

DRUGS IN AGING AND ITS PREVENTION

Certain drugs have long been known to have the power to defer the symptoms of aging, sometimes to extents that seemed incredible before modern scientific studies of senility had shown the reasons for such effects. The most important of these drugs are arsenic, iodine, and iron.

Arsenic. It has been more or less common knowledge for a long time that some people who were arsenic-eaters had beautiful complexions and also looked much younger than they really were. Lorand tells us that the habit of eating arsenic has long been common among the people of Styria, in the western part of the old Austria-Hungary. It seems that their main incentive for taking arsenic is that it gives them more strength and vitality for hard work that requires endurance, such as mountain-climbing. It is also said that they have an unusual number of very old people who do not look old and are strong and vigorous.

My own preceptor and family physician told me that *his* preceptor was an arsenic addict, and that at the age of seventy-five he looked like a man in his prime—

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about thirty-five. His skin was smooth and clear and showed no wrinkles. His hair was thick, black, and glossy. His mentality was perfect. This remarkable man died of pneumonia when seventy-five years old.

Medical literature gives records of many similar cases of retained youthful appearance in persons addicted to arsenic. The physiological reasons why arsenic sometimes so greatly increases longevity are now known, at least in part. One of the constituents of the thyroid gland is arsenic, and that gland appears to be the most important organ in the body—if indeed that can be said of any one organ, when they are all so interdependent. One of the mechanical effects of arsenic is to dilate the arterioles—the microscopic blood-vessels. The practical meaning of this is that more blood passes through the vital organs and, in fact, into all the tissues. The results are (1) more nourishment and more oxygen everywhere, and (2) better flushing and elimination of the waste products of nutrition, and (3) less deposition of the precipitated and insoluble substances that come from stagnation and irritation of the vital tissues by intestinal poisoning and from excessive meat eating.

Arsenic is widely used in medicine, both as a tonic and as a specific remedy in chronic malaria. It is used with varying success in many skin diseases. Arsenic is the basis of the famous 606, or salvarsan, and in that form is now everywhere used in the treatment of active syphilis. Arsenic is also the basis of atoxyl, the best

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remedy so far discovered for the terrible African sleeping-sickness. Much has been claimed for arsenic in the treatment of tuberculosis.

Iodine. The positive value of arsenic in the treatment of senility, and more especially in its prevention, is firmly established by the studies of Lorand and many other scientists. It has long been known that iodine is one of the best specifics for syphilis and chronic rheumatism, both of which produce in young persons some of the typical physical signs of old age. Iodine, as has already been said, is the essential ingredient of the internal secretion of the thyroid gland; and the bearing of that gland on youth, age, nutrition, and mentality is one of the most important discoveries—if not the most important—in medical science.

The physiological and chemical reasons for the known effects of iodine are (1) that it makes the blood more fluid, and (2) that it tends slowly to dissolve out masses of abnormal deposits left by certain diseases, notably syphilis, rheumatism, gout, and malaria. The greater fluidity imparted to the blood by iodine gives better and quicker circulation through the minute blood-vessels which supply all the tissues with nourishment and carry away the waste products of nutrition, which, when there is stagnation in the microscopic vessels, tend to irritate tissues and to leave in them insoluble deposits.

I have seen cases of obstinate pyorrhea alveolaris show much improvement under iodine treatment, both

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internally and locally. Now pyorrhea is a chronic disease which continuously poisons the entire body with pus. The way in which iodine acts in this disease is, at least in part, that by making the blood more fluid it changes the stagnant circulation in the diseased and spongy gums into more rapid current and exposes the pus bacteria to a moving current of fresh germicidal blood.

People who take a prolonged course of iodine treatment generally feel better in every way, and feel and look younger.

Iron. Iron is the chief constituent of the blood corpuscles and of their red color. Obviously, therefore, iron is, mechanically, the one element of first importance in the body, and its supply must be kept up, whatever else may suffer. In old age the blood is always poorer in iron. The reason is that the blood-forming organs have deteriorated, along with the other vital organs, as senility develops.

Normally the intake of iron takes care of itself, for iron is one of the most widely diffused substances, and many foods contain it. In abnormal conditions, however, the body is unable to assimilate the iron in the food at a rate necessary for the upkeep of the blood. In senility, as already mentioned, the blood-making organs are no longer able to manufacture enough new red blood corpuscles to keep up the normal supply. In certain other diseases the blood making is inadequate even in youth. In these latter and in senility, therefore, nature is helped

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out by giving iron in medicinal form, and in excess of the food iron, to make it easier for the diseased or degenerated blood-making organs to find the necessary iron. The colloid preparation of iron is theoretically much better than the inorganic iron salts usually given, because it physiologically nearer to iron as it occurs in the body, and should therefore be much easier for the blood-making organs to take hold of.

Phosphorus. Phosphorus is another element which occupies a very important place in the economy, for it helps to build up bones as calcium phosphate, and is also a constituent of the nervous system. Its place in relation to youth and senility is exceedingly important and vital. Although calcium phosphate is the main constituent of bone, it plays the same part in the abnormal deposits of arteriosclerosis and senility. In connection with the causation of aging, however, we have not yet sufficient data to make further reference to it worth while in this book.

Animal Extracts. In addition to the four drugs that have just been dealt with, come the various animal glandular extracts which are now in much use by doctors, and which occupy a high place in the list of remedies for old age or its retardation. These have been already discussed in the preceding chapter.

Alcohol. Since prohibition was established by federal law in the United States, any reference to alcohol or discussion of it always arouses more or less feeling, one way or the other. The recent Report of

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the Alcohol Investigating Committee of the Medical Research Council of England should scientifically and unemotionally settle the place and physiological properties of alcohol for all reasonable people who understand physiology sufficiently to be able to follow it. Being made in England, a country not yet under legal prohibition, its conclusions may be considered as free from that personal bias, one way or the other, which is nearly always touched like a funny-bone whenever alcohol is discussed in America. Here are some of its conclusions, summarized, as to the action of alcohol on the human organism:

That alcohol has an established food value, and that its absorption is complete; that wine and beer may act as auxiliary foods and may aid recovery from wasting diseases; that even small doses impair the efficiency of all muscular acts; that the mental processes are depressed—except in matters of simple memory, such as words seen before; that moderate amounts of alcohol have no particular effects on stomach or intestinal digestion; that chronic alcoholism may cause degenerative changes in the reproductive organs of both sexes; that the influence of alcohol on the germ-plasm is transmitted by heredity; that alcohol is not a specific for any disease, though its mild narcotic action may be very valuable; that its food value may be considerable in cases where little other nourishment can be tolerated; that in diabetes mellitus, even when insulin is being given, alcohol may be an important part of a scienti-

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fically regulated diet ; that in excess it lowers resistance to certain infectious diseases.

The final summing up of the report is as follows :

Alcohol, when properly used, is a genuine therapeutic agent. If its use in other connections were unknown it would still be a valuable item in the Pharmacopœia. Its true utility, however, is liable to be obscured by the unthinking attribution to it of various activities which it does not possess, and by the popular custom of recourse to it in almost every emergency.

The fact stands then that alcohol is oxidized and, as it were, burned up in the body as fuel, leaving a residue of carbon dioxide and water, exactly as occurs with the sugars in their final use by the tissues. Alcohol is therefore in that sense a food, for it can coöperate with the carbohydrate foods in supplying fuel which keeps up with the animal heat and physical energy.

Just because alcohol used as a pleasurable drink is often grossly abused, it is childish for people who have studied physiology to close their minds to the known facts as to what happens to alcohol in the body, and to cry "wolf" whenever alcohol is mentioned.

Again, there are reasons for believing that the final form of the blood sugar, before its use by the tissues is possible, is a substance which answers to most or all of the chemical tests for alcohol. Alcohol, or something so much like it that it could not be chemically distinguished from it, has been extracted from fresh animal

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and human tissues, urine, and milk in minute quantities. By considerable labor, enough was obtained to *burn* it, and thus demonstrate one further property of alcohol. As far back as February, 1904, in an article in the "Journal of the American Medical Association," I called attention to the experiments which brought out the very interesting and suggestive results just mentioned. In the same article I recommended alcohol as a logical food adjunct in diabetes mellitus, and as a remedy in certain acute infectious diseases.

Recent reseaches prove that alcohol habitually taken to excess often hastens arteriosclerosis and permanently injures the functional tissues of the liver, kidneys, and most if not all of the ductless glands. Whether small amounts taken daily, such as a cocktail before dinner, may gradually injure the vital glands and hasten the onset of senile changes, we cannot say with certainty. But the fact that even small doses invariably impair all muscular movements requiring fine coördination, and measurably depress the mental processes, rather strongly suggests that free alcohol should never be used habitually in health, even in small amounts, although its property as an easily assimilable food is unquestionably valuable in certain sicknesses where the capacity to digest and assimilate ordinary foods is for the time being seriously impaired.

There are historical instances of very great longevity where alcohol had been taken habitually and liberally up to the time of death. Several such cases are re-

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ferred to in another chapter. We find it hard to believe, however, that alcohol had anything to do with the prolongation of the lives of these men. We are more inclined to think that they attained their great ages in spite of the alcohol they took, and that if they had let it alone they might have lived many years longer. Their immunity to any harmful effects of alcohol for such long periods was probably due to exceptionally good elimination, which can counteract many errors of living.

Tobacco. No habit is more prevalent than the use of tobacco, mostly by smoking. Tobacco was first brought to England in 1585 by Sir Francis Drake, and the habit soon spread throughout Europe, and afterward to the Orient. The introduction of the drug and the spread of the habit through Western nations corresponds with the most progressive period of history, and with a very considerable increase in the average age limit. The opinions of medical men vary widely as to the good or harm done by tobacco. Nicotine, which is the active agent of tobacco, is a very violent poison, which often tends to bring about arteriosclerosis. In some cases it attacks parts of the nervous system. Not infrequently it affects the optic nerve and the other inner structures of the eyeball. Lorand says that its tendency to accelerate senility is most often seen in women, and he goes so far as to say that no single agent so soon dries up and ruins the skin and complexion. Animal experiments with nicotine have

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produced areas of arteriosclerosis in the large blood-vessels. The psychological effects of the tobacco habit are quite definite and can hardly be considered as desirable. A man who smokes is usually miserable when not smoking. He must smoke during business hours, at home, at meals, when calling, when in bed. His finer senses and instincts are blunted, as may be seen when he cannot refrain from smoking even when making social calls, and asks a lady if he may smoke while he is her guest, at a time when he must know that she would hesitate to refuse for fear of offending him. The desire to smoke means desire for a narcotic, for dope. All other narcotics have their beneficent uses during sickness and suffering. But it is universally agreed that their use in health is unnecessary and harmful. Tobacco is actually a narcotic. Its use in health is therefore nothing but a bad habit.

Summary. The drugs which influence aging may be put into two classes; constructive and destructive; those which restrain or defer aging, and those which hasten it. The main drugs in the first class are arsenic, iodine, iron, and certain glandular extracts. Those of the second class are mainly alcohol and tobacco.

New Hints on Dosage. From these remarkable modern studies into the causes of aging come many new hints as to specific treatment of diseases. One of the strongest hints seems to be as to dosage. There is now much evidence which tends to prove that good health and functioning rest on a physical basis of normally

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functioning ductless and other glands. Back of that is of course the nervous system, and back of *that* the subconscious mind. But once there is disturbance of the thyroid gland, it must react badly on the sympathetic nervous system as an instrument of the subconscious. Hence there soon comes about a vicious circle.

It seems evident now that even in the recent past the tendency has been to give too much of the iodides and of thyroid extract. The proof of this seems to be the demonstrated fact that small doses help and stimulate a weakened or diseased thyroid gland and restore its equilibrium, while larger doses irritate and cause more or less degeneration in the thyroid substance. This may account for the many failures with thyroid extract in inexperienced hands, and even for the harm done by its use. It would therefore seem that rational future treatment with this remedy should aim to do no more than restore the normal thyroid equilibrium, and then to leave the rest to nature.

CHAPTER V

SURGICAL OPERATIONS

We have referred briefly to the modern gland operation in Chapter I. Probably the opinion of the majority of the medical profession at present is that any benefits from such operations are temporary at best, and in many cases entirely psychological. There are, however, some medical men who believe in them. An important piece of medical testimony is that of Dr. G. F. Lydston, well known both professionally and as an author of fiction. I have not read his original paper, but from extensive quotations and references to it in a recent article it would appear that Lydston was to some extent permanently rejuvenated after submitting to the operation himself. He has also reported a number of other cases more or less rejuvenated or benefited by the operation. In this eminent case as in all others, however, there remains the open question as to what extent the attitude of the subconscious mind was responsible for the actual physical and mental benefits that are said to have come after gland operations.

The names of Steinach and Voronoff have become very prominent in this work in the last few years.

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Steinach began with experiments on animals that seemed to show that the sex glands could be transplanted from animal to animal of the same species and live, with all their own characters, in new fields. He even succeeded in exchanging glands from one sex to another, and in reversing some of the sexual traits of the animals.

In Steinach's studies in rejuvenation he sought to ascertain whether aging, or rather senescence, is in effect a chronic disease; and if so, whether scientific means could be found to combat it as with other chronic diseases. He believes that this has been in a measure accomplished.

With men, Steinach has apparently had remarkable success, at least temporarily, by means of surgical treatment without gland implantations. The operation reverses the current of a man's own sex gland secretions so that instead of passing outward they turn inward. Thus every part of the secretions, internal and external, of the gland or glands treated, is absorbed into the blood. The operation seems to be exceedingly simple, and to consist merely of tying a ligature around the duct near the testicle which prevents any further outflow of secretion. Apparently tying the duct of one gland is sufficient to bring about the rejuvenating changes, and has the advantage of preserving the power of procreation.

Steinach has reported many cases so treated, and with astonishing results. Within a few weeks or months

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senile and pre-senile men were practically renewed, in feelings, strength, and looks. Among the numerous operations performed, Stanley Hall has described three cases in English at considerable length in his great book, "Senescence." I have summarized them in non-technical language as follows:

Case 1. A case of pre-senility, forty-four, thin, weak, wrinkled, unable to work because so easily tired out. Almost impotent. Operation performed, tying off the ducts of both testes. After a few weeks there was a striking change. Weight increased and wrinkles almost vanished. In five months he was again strong enough to carry heavy burdens. Libido and potency returned with great intensity. The hair and beard grew much faster. During the year and a half he was under observation he seemed in every way a vigorous and young man.

Case 2. A business man of seventy-one. For many years he had been showing signs of encroaching age, including senile precipitation, dizziness, shortness of breath, weakness of heart, extreme fatigue, and trembling. He had been entirely impotent for eight years. One testicle removed on account of disease. Operation performed and duct of remaining testicle tied. Within a few months there were marked changes for the better. A feeling of masculinity returned. After nine months, to the man's intense surprise, certain physical phenomena recurred. Appetite increased, and digestion was perfect. The former feelings of profound depression gave

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place to fullness of the joy of life. Fatigue and dizziness disappeared. The hair and beard grew more rapidly. He can think clearly again, and his friends cannot believe that he is seventy-one.

Case 3. A merchant of sixty-six. Senile symptoms for about five years. Impairment of all muscular power, of breathing, thinking, and memory. Libido almost gone. Emaciated. Had chronic prostatic trouble and had to use a catheter. Operation performed. Ducts of both testes tied. Rapid recovery followed, with improvement of nearly all symptoms.

With women, Steinach does not as yet seem to have had such startling success as with men, though he claims to have had important results with mild X-ray stimulation.

In sum, Steinach believes that his work thus far has demonstrated that aging can be to some extent deferred.

Serge Voronoff seems to have achieved remarkable success in gland grafting. After observing the results in a large number of animals operated on, he says, "Several of these animals operated on have exceeded the age limit which animals of their species generally attain and, instead of showing signs of decrepitude and senility, they give promise of astounding vigor."

Along this line, but with tissues other than sexual glands, Voronoff has done some astounding things. He transplanted the thyroid gland of an ape into the neck of a boy with symptoms of cretinism. Contrary to what we were formerly taught to expect, the trans-

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planted gland was not absorbed but lived in its new place. The symptoms of cretinism rapidly disappeared. The boy became a good scholar. The last report of him was that he was a soldier at the battle-front.

In another case equally remarkable, Voronoff transplanted the fibula, or outer bone of the leg, from an ape into the leg of a child whose fibula was congenitally absent. The ape bone took root and lived and functioned well in its new location.

Summing up the reports of Lydston, Steinach, and Voronoff, and their confirmation to some extent by others, it would seem to be settled, notwithstanding the general skepticism of the medical profession, that something definite can now be done by means of surgery and gland transplantation to stave off old age for a time. But a burning question at once comes up: how long will such apparent rejuvenation last? And this question brings us directly to an anatomical consideration that we were formerly taught was of the utmost significance.

All functioning organs depend for their life and upkeep on two things: (1) their nourishment derived from the blood or lymph; and (2) their nerve supply from the sympathetic plexuses.

When organs such as the testes or ovaries are transplanted from one human body into another—or from an animal body into a human body—their original blood and nerve supplies are cut off, and their nourishment must thereafter be got from the lymph which surrounds them by means of osmosis—an imperfect supply at best,

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but sometimes enough to keep them alive for a while, or until new blood-vessels can have time to form. The nerve supply from the sympathetic, however, according to our older teaching, is not renewed in the new body, and therefore the gland could not be expected to function again normally.

To cite a type of case which is to some extent apropos : Carrel and others have removed kidneys from dogs and kept them artificially supplied with fresh blood. Such kidneys would secrete urine for several hours, but after a time they would entirely lose the power to do so. Their blood supply had been kept up, but their sympathetic nerve supply had been cut off and could not be renewed.

Cut nerves must not be thought of as like cut electric wires. We can restore an electric break instantly by merely putting the cut ends together so that they touch. When cut nerves are sewed together there is no nerve transmission at all for a long time, sometimes for several months. The reason is that nervous force cannot pass through merely approximated contacts of cut nerve trunks, but only through a complicated microscopic network of fine fibrils which grows with exceeding slowness. Were it otherwise there would be nothing to prevent the frequent transplantation of sound kidneys from people killed by accidents into the places of diseased kidneys of incurable nephritics. There are surgeons skilful enough to do this. They could connect up the blood supply of the transplanted organs, but they

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could not reestablish the microscopic nerve supply. From these anatomical facts it would appear theoretically improbable, according to our old teaching, that any transplanted gland could continue to furnish its true internal secretion, even though its cells might be kept alive by absorbed nourishment.

And yet—what about the apparently confirmed achievements of Lydston, Steinach, and Voronoff? Moreover it has been recently reported that kidney transplantation has been successfully done in cats and dogs. Do nerve connections grow more quickly than we once believed? Or do transplanted glands need any particular nerve supply after all?

Indeed the "Year Book of General Medicine" for 1925 definitely states that grafted thyroid tissue, at least, functions independently of nerve supply.

An important contribution to the vital question of the duration of gland grafts is found in a recent article in the July-August, 1925, issue of "Endocrinology," by Professor R. G. Hoskins, in which he has reviewed the work done by many investigators on the effects of testicle grafts on men and animals. In his opinion there seems little doubt that testicle grafting can produce "definite somatic changes and definite erotization." He found, however, that all such grafts disappeared within one year, and often within several months. Moreover the general physical effects of the grafts did not last longer than the grafts themselves, though the erotic effects were usually much more enduring.

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A still more recent article ("Scientific American," October, 1925) encourages the hope that Voronoff has discovered a method which promises far longer durations of actively functioning gland transplantations than Hoskins's review finds to be the rule. Voronoff reports recently ("Scientific American," October, 1925) that since 1917 he has abandoned the first method of transplanting entire male sex glands. Instead he now splits the glands, and thus assures the grafts of sufficient blood and lymph supply while taking root in their new situations. Since he has used this method his results have been far more satisfactory and constant.

One of Voronoff's most striking cases is that of an old ram of twelve years—nearly the ram age limit—who was so senile and decrepit that he could hardly walk. Voronoff grafted into this old worn-out ram a sex gland from a two-year-old animal. A few months later the old ram was to all appearances a robust and virile and splendid animal. Perhaps the most significant result obtained was that this rejuvenated ram sired a fine kid from a young mate. The grafted gland tissue could not directly have caused procreation because it had no duct. What it actually did was to stimulate and revivify the old ram's senile glands and restore the function of procreation—a most startling result.

To leave no question of doubt as to cause and effect, Voronoff removed from the rejuvenated ram the gland grafts. The animal quickly lost its renewed youth and again became senile and decrepit. Once more Voronoff

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grafted new gland tissues, and for the second time the senile ram became rejuvenated as completely as before. In the presence of these wonderful results, who could say that they may not have profound bearing on human rejuvenation?

We must not forget that the accepted limit of the accepted science of yesterday may be broken through to-day. That has happened only too often. As a rule, great discoveries have been ignored by the stand-pat science of their day until long after they were known empirically and even used by people not so "authoritative." Galileo was forced by the orthodoxy of his time, then vested in the church, publicly to deny the truth of his astronomical discoveries. Mesmerism was officially pronounced a complete fraud by a scientific commission appointed by the French government—of which, I am sorry to say, our own Franklin was an honorary member.

Coming back to the brass tacks of our present subject, it looks as if the erstwhile impossible establishment of a blood and nerve supply to a transplanted gland or organ has now been made. If so, then the next logical step should be to change the laws of most lands to allow the confiscation of all glands of all healthy persons killed by accident, for the revivification and rejuvenation of the living. The principle of physiology is not yet abandoned that transplanted tissues grow best in the same species or allied species. Hence human glands should stand better chances when

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transplanted than would animal glands put into men. Besides, there is something decidedly repugnant to many people in the thought that an intimate essence which contributes so largely in making up one's personality should be drawn from the glands of an animal.

Before deciding on any surgical procedure, however, it seems to be the sanest course, for the *prevention* of senility, first and thoroughly to try out the physical, mental, dietetic, and medicinal treatment as outlined in Chapter XVI.

For the curative treatment of actual senility, however, and accepting as fact the reports of the successful cases of Steinach and Voronoff, there is no serious reason now apparent for not trying the Steinach operation for turning one's own glandular secretions into the blood stream. Where one has only a few years left at the best under ordinary conditions, why not? There is so little to lose, and, it may be, so much to gain!

An interesting and perhaps serious thought in relation to the rejuvenating operation of Steinach is that it appears to be essentially the same operation that is now done in some enlightened communities, under legal authority, for the sterilization of criminals and mental and moral degenerates. It would be anything but a pleasant prospect that such sterilized criminals and defectives might thus become revived and even rejuvenated, and that, except for procreation, their powers for mischief and crime might be strengthened and prolonged indefinitely. It is possibly another warning that every

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artificial and manifestly unnatural human interference with the vital processes of nature, for whatever purpose, may bring in its train compensatory undesirable effects. There is something about the thought of rejuvenated criminals and defectives which has an uncomfortable suggestion of turning loose on society a band of Frankenstein monsters.

Benjamin, of New York, has a very important and up-to-date serial article in the "New York Medical Journal and Record" of October 21, November 4, and November 18, 1925, devoted entirely to the Steinach operation in men. He reports 114 cases operated on by himself. No one with an open mind can read that article, with the details and the sequel of every case, without being convinced that the operation gives decided relief of the symptoms and signs of aging in at least seventy-five per cent of cases. One part of the theory of the Steinach operation seems questionable to me, and I should like to see a modification in the technique of that part tried with some selected cases. But theory or no theory, the Steinach operation, as performed by Dr. Benjamin, seems to have very definite value in almost all cases of men of sixty or thereabouts who show the earmarks of senility. In a later chapter I give an extended reference to the remarkable rejuvenation of Dr. Adolph Lorenz, the famous Vienna surgeon of a quarter of a century ago.

CHAPTER VI

SUBCONSCIOUS PSYCHOLOGY

Although much is said in later chapters about the workings of the subconscious mind in relation to health and disease, it is believed advisable at this point to devote an entire chapter to the psychology of the subconscious. Unless one has a rather clear idea of what goes on there, one is hardly able to realize the bearing of subconscious complexes on the gradual development of senile changes in the human body. It is recognized, however, that the mere mention of such a possibility will at first thought startle even many students of psychology who are yet unfamiliar with the modern concept of aging as a chronic disease, and who in consequence still hold to the accepted belief that old age is a natural and normal process of involution.

This attitude of accepted negative belief and educated incredulity is so general that it takes a considerable amount of will and effort to break through the barriers of established thinking and to investigate for ourselves. There seems to be a kind of race telepathy which inhibits and holds us back from original and independent thinking. But once we succeed in breaking through, we find

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that the limitations to our further progress are largely the remains of imaginary barriers of conventional group thought, and that there is much, if not everything, in Troward's aphorism, "The only limitation is the belief in limitation."

Two Minds. It is very difficult for many people to grasp the idea of such a thing as a *subconscious* mind; a part of the mind that our waking consciousness is not aware of, with desires and activities all its own which go on secretly and ceaselessly; but all without the knowledge of that which they think of as their entire mind and consciousness. It seems to them incredible, that a mind could be spilt up and working in sections or compartments, each more or less unknown to the others—a mind divided against itself. And yet this, to psychologists, is no longer a matter of argument but settled fact.

Self vs. Self. There are, however, certain common experiences coming to every one of us, in which a moment's thought will convince us that two minds strive in us at cross-purposes. For example, say, a man is very poor. He sees a well dressed person drop a purse. He feels an impulse to pick up the purse and put it in his pocket. Then another part of his mind says: "Pick it up—yes! but return it to the loser." And now the first part of his mind comes back with: "I need it more than he does. He wouldn't miss it anyway!" But the other part is on the job again and insists: "No, no, young man, that won't do. Give it back!" And

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so the better part wins—perhaps!—and Self and Company give back the purse. Yet it may be that after the purse has been handed over, one part of him says to the other part: “If only I hadn’t happened to be looking just when he dropped the purse, it would have been mine now, and with a clear conscience!” Now what part of him was it that said *that*?

Take another example. Suppose that you were just recovering from typhoid fever and felt very hungry, and that by some mistake a nurse brought you a plate of porterhouse steak smothered with onions. One part of you would long to get away with it before the nurse discovered her mistake. But another part of you would know that it was a crazy thing to do, and would try to draw your hands back just as they were reaching for the knife and fork.

Surely both these commonplace examples must show a conflict between two selves within you, one of which is your subconscious mind and seeks to gratify desire without counting costs.

Origin of Consciousness. The easiest way to get an idea of how the subconscious works on the body is to go back to the origin of consciousness. To do that we must obviously start with the human embryo. After the union of the two germ cells it gradually grows and develops. At first its nutrition is obtained only from the fluids of the surrounding maternal matrix. As the form becomes more complex and thicker it can no longer be nourished merely by absorption—osmosis

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—from the surrounding fluids. And then something happens. A heart is formed, a natural pump. Little tubes come next, the beginnings of blood-vessels—arteries and veins—ramifying more and more deeply as the form grows—and through them the heart pumps nourishing blood. Organ after organ forms, until a complete human being in miniature is made. The subsequent growth is mostly an increase in size.

Long before birth the fetus usually shows by its movements that it is *alive*. When first born the child cries and shows conscious perception by the movements of eyes and hands, and by almost immediately taking to the breast.

Outwardly and obviously, then, what we ordinarily think of as consciousness has its start in that way. But that is not by any means the beginning of consciousness. The great psychoanalysts tell us that the child has consciousness of its own for some months before birth.

Life and Consciousness. We now come to a most important consideration: the relation of consciousness to *life*, as well as that of life to *consciousness*. We can think, perhaps, of life without consciousness; but we cannot possibly think of consciousness without life—any more than we can think of electricity without a conducting medium. Returning to the embryo, at what stage of embryonic development does the first spark of what is usually thought of as consciousness come? Following that question comes another just as inter-

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esting: when consciousness first appeared, where did it come from?

Scientific Analogies. At this point one may think that we are headed for metaphysical speculations, or for the theory of reincarnation. No. It will not be necessary to go as far back as that to answer the question of the origin of the child's consciousness. It is a principle of science that *something* cannot come from *nothing*. There is one law which is universal, and that is the law of cause and effect: there can be no effect without a cause. Electricity is the liberation of electrons—which themselves are the ultimate units (if they are really ultimate) of all known material substances. Therefore electricity is just a form of matter, came out of matter, and was and is matter. In that sense electricity, and perhaps all other forces, may be said to be self-produced.

Consciousness and Force. Furthermore it is another law of science that all forces are mutually convertible; and this brings us back to *life*. Life—vitality—is obviously one of nature's forces. Admitting that, where does consciousness come in? Is consciousness a force, or merely an emanation from combinations of matter? Let us see! So far there is no machine or instrument that I know of, recognized by science, that can be moved, or move a needle on a dial, by mere unaided conscious attention. But there is testimony to the effect that Baraduc of Paris constructed such an instrument, and I know of two distinguished witnesses

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to its power: one, the late Judge Thomas Troward; the other, my late and deeply regretted friend Vance Thompson.¹

Perret's Emanation. It seems certain now that living human bodies do radiate or emanate an actual force of some kind which has motive power. This has recently been demonstrated by Perret, the well known volcanologist of the Carnegie Institute, and the author of "The Vesuvius Eruption of 1906," published in 1924. Perret has shown that this force can rotate small wheels balanced on a needle-point. The direction of the rotation varies with the hand used and is constant. The flame of a candle is curved and oscillated. The force passes through every kind of material yet tried and is therefore not electricity. It is not affected by heat or cold. Its intensity is inconstant but seems to be influenced by the state of vitality or debility of the body. Perret has even perfected an ingenious apparatus which graphically records the movements and their intensity.²

Intelligence and Force. If Baraduc has actually demonstrated that consciousness has motive power, as Perret has certainly done as to vitality or life force, well and good. But there is still other evidence that consciousness is in a sense a force, though the idea may

¹ See "L'Ame Humaine," Dr. H. Baraduc, Paris, 1911.

² See "Su di un Emanazione, Forza Vitale Effluente, Finoggi Non Dimostra," Frank A. Perret, "Bollettino della Società dei Naturalisti in Napoli," 1923.

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seem far-fetched to some. We have before us the cities and other works of man. They, like all other things, are effects from previous causes; and what are those causes but the conscious thought, desire, and will of man? To be sure, bricks and steel and concrete were not made and erected into buildings by sitting down and concentrating thought upon them; but conscious thought was the super-force that set in motion the other forces that performed the rough work, and without which nothing would have been planned and done.

Coming back now to the origin of consciousness, we have the plain analogy that as electricity is sublimated matter, so consciousness is sublimated life. In other words, consciousness and life are different expressions of the same thing. In saying this, however, I certainly do not mean to be understood as echoing the materialistic conception of our personal consciousness as merely an emanation from matter. But to go into that here would lead us too far afield from the present subject.

Referring once more to our electrical analogy, we know that as electricity comes from matter, so matter, in the first place, comes from electricity—since all matter is composed ultimately of electrons and protons, in the present scientific view.

So with life and consciousness. The infant's consciousness came from or *through* its life; and its life came from its consciousness—that elemental conscious-

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ness which originally came to it when the two *living* germ cells united to form the ovum.

Subconscious Life. We should now be able to get a clearer idea of the differences between our ordinary every-day consciousness, and that far larger part of our consciousness which is now called the subconscious mind, or the unconscious. In the broad conception of Eastern philosophy, *all* life is *conscious* life, but consciousness at an elemental level not capable of knowledge of *self*. The lowest form of such consciousness is seen in the amœba, a unicellular organism which is able to contract and expand itself slowly and to extend projections of itself, and thus to make slight movements in space.

In the human body the white corpuscles of the blood are of that type. The cells of the various tissues are fixed together in groups, and their vital activities are more *chemical* than locomotive; though the cells of muscular tissues have also motive power, but in groups. Now all such cellular life, as has been said before, is conscious life, but below the level of self-consciousness. It is *subconscious* life, and the aggregate of all the cellular and organic life in our bodies constitutes the automatic or functional part of *our subconscious mind*. Thus during human embryonic life its consciousness is entirely subconscious.

Infant Consciousness. For some time after birth the infant consciousness remains at the subconscious

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level. But its brain and body are like a sensitive plate, and they instantly register every new experience in the outer world as an impression in its subconscious mind, which at first is its total consciousness. Under repeated stimuli of new experiences a differentiation takes place in the consciousness of the infant, which is the beginning of its *self*-consciousness. From then onward the personality and psychology of the child develop.

From this résumé it seems clear that from the early stages of human life all the nutritive and developmental activities are directed by a consciousness in the form of a primitive subconscious mind. In those early stages the functional automatism of the organs is in perfect harmony with a subconscious mind entirely undisturbed by outside influences and impressions.

After birth the life is a continuous course of new experiences, all of which are registered and preserved, in minutest detail, in the limitless four-dimensional space of the subconscious mind.

Impersonality. One of the most remarkable things about the subconscious is that it is entirely impersonal. Its sense of identity is most of the time automatically that of the objective mind. Yet under the influence of hypnotism, when the objective mind is for the time put to sleep or driven out, the subconscious will believe anything told it by the operator. It will believe without question that it is an Indian, a bandit, an animal. It will accept the most absurd suggestion or statement as absolute fact, and will proceed to act ac-

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cordingly. A hypnotized subject will eat a candle with satisfaction when told that it is cake, or drink quinine and water with every appearance of pleasure when told that they are sweet wine.

Memory. Memory is absolutely perfect in the subconscious mind. Every experience, even the most trivial, is always present there in every tiny detail, even when entirely forgotten by the outer consciousness. This has been overwhelmingly demonstrated by hypnotism; It has also been unpleasantly experienced by many persons who have been saved from drowning, or who have been otherwise dragged back to life when the hand of death has already been felt. It is probable that such is the experience of every dying person.

False Beliefs. We come at last to some practical application of knowledge. The effects of false beliefs strongly impressed in the subconscious are sometimes exceedingly serious. A rather common one that has sent many ignorant and over-emotional people into insane asylums is that they have somehow committed the "unpardonable sin," whatever that may be. Somewhat less serious are beliefs that one has committed acts, or entertained thoughts, which were supposed to be sinful in the narrow conventional codes in which one has been brought up. An instructive case of this sort is given by Dr. Josephine Jackson in "Outwitting Our Nerves."

One of her patients, an educated and refined woman of middle age, had suffered from nausea for years. For a long time Dr. Jackson tried to discover the

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physical cause but was unable to find one. Suspecting a psychic cause, she gradually employed psychoanalytic methods, and at last one day uncovered the source of the trouble. The woman had been brought up with narrow puritanical ideas in regard to sex. When eighteen years old she had loved a boy friend. Once, during a tender scene, she had experienced a feeling of sex attraction toward the boy. That was all there was to it. But according to her puritanical code she had sinned and hopelessly degraded herself. She was overcome with remorse, and tried desperately to put the horrible thought out of her mind. Finally she succeeded in forgetting it; that is to say, she managed to drive the remembrance of her moment of terrible sin and wild oats into the depths of her subconscious, where it secretly lived and fed on her nervous system for many years, showing itself outwardly in *nausea*. "Her nausea was the symbol of moral disgust. Physical nausea she was willing to acknowledge, but not this other thing." The proof that this imaginary sexual sin of her early youth was the real cause of her physical nausea many years afterward, was the result of the case. After Dr. Jackson had revealed this connection to her and had made her realize what a fool she had been, the nausea disappeared, and for good.

When a belief of any kind is impressed in the subconscious mind it then proceeds to act in accordance with it. Whether the belief is true or false makes not the slightest difference. For instance, one may

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somehow get a notion that a certain article of diet does not agree with the stomach and will always make him sick. Here is a case in point:

A friend of mine one day attended a dinner on a hospital ship. The menu included mushrooms. He ate a plate of these and enjoyed them. During the night, after he had gone to bed, he awoke with violent cramps in his stomach, followed by vomiting and diarrhea. Whenever he thought of mushrooms his nausea increased. After recovering from the attack of acute indigestion he continued to feel signs of sickness if mushrooms were merely mentioned. He then became convinced that mushrooms did not agree with him and that he should never eat them again.

It transpired later that several other men at that dinner became ill with similar symptoms, which of course indicated that the mess of mushrooms was tainted with ptomaine poisons. But my friend, who for some reason had previously eaten mushrooms only once or twice in his life, remained convinced that he had an idiosyncrasy against mushrooms and could not eat them without getting sick, and his aversion to even the thought of them continued in full force. Later on it was pointed out to him how much he was the loser in gustatory sensation and social pleasure because of not being able to eat mushrooms, and of getting nauseated if he saw others eating them. Eventually he was made to realize that it was possible his sickness had been caused not by fresh but by poisoned mush-

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rooms, which had affected other men as he had been. He was strongly advised to have another try at mushrooms before renouncing them for life. With many misgivings he consented. After gagging at the first mouthful or two, the feeling of nausea left him and gave place to keen enjoyment of the delicious dish. No disagreeable symptoms followed, and thereafter he often ordered mushrooms for luncheon.

This man's subconscious had been strongly impressed with a false belief in an imaginary idiosyncrasy toward mushrooms. His subconscious therefore played up to this belief with tireless energy. It was always on the job, as was proved by his feeling of nausea at even the mention of mushrooms. A mushroom complex was established. But when the conscious mind began to change its attitude from blind belief to intelligent discrimination, the complex was weakened, and when put to the test, it broke up and vanished.

In later chapters are mentioned other instances of the complete impressibility of the subconscious mind and its terribly destructive power when under the spell of a false belief.

Convictions of Inferiority. One of the most destructive forms of false belief that can be impressed in the subconscious is that of inferiority, physical or mental. One school of psychoanalysis is largely devoted to this subject and is ably set forth by Adler in his book, "Organ Inferiority and Its Psychological Compensation." Especially serious are convictions of sexual inferiority,

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where no physical bases for them exist. But similar false beliefs may become attached to any other organs of the body. Belief or fear of loss of acquired proficiency is very common and disconcerting. Thus surgeons often lose their confidence and nerve if they stop operating for some time. The following case is an example of the effects of a false belief in organ inferiority and of its cure:

A middle-aged surgeon in good general health found himself gradually developing symptoms of obstructive enlargement of the prostate gland. He had treated many cases and given some study to the subject, and had somehow acquired a horror of the condition and the curative operation. He felt an irrational reluctance to consult another surgeon and submit to an examination. He tried medicines, but without relief, and his symptoms grew worse until he believed that an operation would soon be inevitable. There was nothing left but to face the music. So he went to a specialist and asked him to make an examination. When the examination was over, the specialist smiled and said:

"I'm afraid I won't get to operate on you."

"What do you mean?" asked the surgeon anxiously.

"That your prostate is not enlarged!"

The surgeon-patient had complete confidence in the judgment and diagnostic skill of the specialist. When the specialist said positively and authoritatively that there was nothing the matter, that settled it in the mind of the other. The gradually acquired complex of

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organ inferiority dissolved and disappeared in the light of truth as a morning mist melts away in the light of the sun. *From that hour all symptoms ceased.* But if the man had allowed his false belief to continue for a few months longer it is probable that actual swelling would eventually have come about. The lesson in this case is the more striking because the patient was a physician familiar with psychoanalysis. It is a forceful example to prove that "the truth shall make you free."

The Urges. Conscious life, or life consciousness, expresses itself in the form of psychic energy. This energy flows outward in certain modes or channels which are called urges. The urges have been variously defined and numbered by authors, but to me they seem reducible under four heads: the self-preservation urge; the self-expression urge; the affinity urge; and the reproductive urge. Interference with the normal satisfaction of these urges is like blocking up the courses of great rivers, which, restrained for a while, eventually overflow their unnatural barriers with destructive violence.

Desire. When a strong desire is impressed in the subconscious mind, and when the fulfilment of that desire is outwardly thwarted or frustrated, it is repressed; that is, sinks below the threshold of the conscious mind into the depths of the subconscious. It is there brooded over indefinitely, influencing and disturbing the conscious mind in many unsuspected ways,

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and more or less seriously affecting the mind, emotions, and physical health.

The subconscious is the region of unmodified *desire*. It is absolutely indifferent and ruthless as to how a particular desire may be satisfied. It is utterly devoid of such considerations as honor, duty, service, or goodness. It is absolutely without sentiment. It is completely, utterly, selfish and self-centered. It is not immoral but *unmoral*. It blindly strives for self-preservation, yet blindly works toward self-destruction under the impression of a false belief; for, as is said elsewhere, it blindly accepts as fact any belief, whether true or false, and trims its course accordingly. Let me give an example of its complete license when free from the control of the higher self during sleep.

A highly educated woman, emancipated from the repressions of stupid conventions, yet with a very strong sense of duty, of service, of motherhood, and of proper respect for old people. She has a mother-in-law, a noble devoted woman of the old dispensation, set in her ways and in her notions as to how children should be brought up. She insists on giving antiquated advice to the younger woman on the management of the children. The daughter-in-law, being what we may call a rather high-strung woman, becomes excessively irritated at this tactless interference with her more modern methods, but hardly ever loses her temper with

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the old lady. Nevertheless her irritation is not killed out but is repressed into her subconscious, where it broods and plots for revenge. In the meantime it maintains a steady position of "watchful waiting," and, being prevented from getting revenge physically, it takes it vicariously, when it can get it—and this is how it does it: When the younger woman sleeps she often dreams that she is beating up her mother-in-law—kicking her, cuffing her, stamping on her. She is ashamed of herself for having such dreams, and fully realizes their psychological significance.

Another example in the same class is that of a man of high ideals as to duty, and a good husband and father. He also has a mother-in-law, whom he respects for a long life of self-sacrifice for her children while they needed what she could give them. But for all that, she irritates him frequently, and whenever she visits her daughter, his wife, he counts the days of her stay with increasing pleasure as they grow less. He always treats her deferentially, but keeps out of her way as much as he can.

One night he dreamed that he was standing on a high hill overlooking a city. He knew somehow that his mother-in-law was there. Something terrible was going on in the city below him. He was not sure just what it was, but he knew that it was something dangerous and destructive and that the city was doomed. He felt that he would not be safe very long where he was, and planned to escape by going far around the hills.

Then he thought of his mother-in-law down there in the midst of the disaster, and wondered what he had better do about her. But it did not take him long to decide, whereupon he said to himself, "Let her shift for herself!"

Here was an elaborately calculated and cruel plan, staged by his subconscious, to get rid of his mother-in-law, in which he was merely a powerless spectator. She had annoyed him—an offense scarcely meriting death, but the subconscious scorns half-measures. With a clear conscience, even for a dream, he could abandon her to her fate, in a situation for which he was not consciously responsible.

Rationalization. Most of us like to think of ourselves as reasoning beings whose actions and conduct are guided by conscience and will. The facts are usually the reverse. We are mostly driven by our *emotions*, and after we have done some impulsive action we immediately seek for perfectly good *reasons* that caused us to act as we did, reasons that will justify us to others and to ourselves. This process is now called rationalization. Every one of us uses it at times. If we look at others who do so we can usually read them pretty clearly. If we could only look at ourselves as we look at others, and then realize that they usually see through our shams as we do through theirs, we should be less apt to expose ourselves to such humiliation. When we do foolish impulsive things we might as well admit that we made mistakes, because, no mat-

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ter what we say, everybody else sees through us.

The Censor. The censor is a curious device of nature to save the face of the ordinary personal consciousness. Let us take as an example a dream of the death of a beloved relative. A middle-aged woman had spent the best years of her youth and womanhood in personal care of an invalid mother. She had sacrificed marriage and motherhood on the altar of what the Orientals call filial piety, which they consider the greatest of virtues. She appeared to be passionately attached to the aged invalid almost to the exclusion of other attachments. One day she told me she was often troubled with a nightmare that her mother was dead, and she was in terror lest these recurrent dreams should be prophetic.

Of course the interpretation of such dreams was obvious to any psychoanalyst. The thwarted love nature of the daughter had hidden itself deep in her subconscious mind. In her conscious mind she was all devotion to the mother. But in sleep the repressed urges of her thwarted emotional life broke loose and expressed themselves by killing the mother who had stood between them and their fulfilment. The daughter was a college woman and immediately grasped the psychological situation when explained to her. At first it came as a great shock and reproach to her, but when the purposes of the urges, and for that matter of life itself, became clear to her, she ceased to blame herself. The complex was broken up as soon as she understood what

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the dream meant, and that dream ceased to trouble her.

A still more impressive and very common form of censorial action is involved in the painful menstruation which handicaps so many young girls and married women. That this may be clear, let us say a few words about the rationale of the function itself. Every menstruation is a miniature labor. During many days before it takes place nature is preparing the entire body for mating and potential motherhood, not only internally but outwardly in enhanced beauty and sexual attractiveness. But artificial social conventions stand between elemental natural desire and its normal fulfilment with single girls and some others. Now we have already shown in many places throughout this book that although deep subconscious desires may be thwarted they are never killed out but are thrown back upon themselves into the crypts, so to speak, of the subconscious, where they are brooded over and where they eventually show forth in some vicarious and abnormal manner.

Thus with the deep and conventionally thwarted mating impulse. Getting no normal attention and response in the outer world, it frames an abnormal appeal in the aspect of sickness and pain, which *compels* attention and response as pity, sympathy, and coddling—a poor substitute for the real thing, but better than nothing to a sexually starved subconscious.

In sum, the censor camouflages the thwarted sexual appeal for reciprocal attention into a piteous but con-

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ventially respectable appeal which invariably gets a modified response.

The practical result of this knowledge to women is that every one of them so affected who reads and *understands* this explanation of her periodical sufferings *will be troubled by them no more*. As the Good Book says, "The truth shall make you free."

Selfishness and Senility. Our civilization is nominally Christian, but in general practice its motto is not so much, "Do as you would be done by," as, "Do others or they'll do you!" The composite result of all this mass selfishness is the untold evil and misery of the civilized as a whole.

Nevertheless a small minority of advanced people think they have discovered that the easiest and surest way to happiness and success is in helpful discriminating service wherever they find opportunity for giving it—and yet not at all by making doormats of themselves.

"Bunk!" will exclaim the unthinking, self-centered, money-mad majority—and very naturally, from their point of view; their experience has gone no further. About the highest sentiment they can live up to is, "The Lord helps those who help themselves"; and a good one in the main, so far as it goes. Unfortunately, however, the Lord doesn't *always* help those who help themselves.

On the other hand, the relatively few who live by the rule of giving themselves and their service rather than enriching themselves say they have always found that

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there is a law of life which pays better than "The Lord helps those who help themselves," and that law is, "The Lord *always* helps those who help others." The existence of such a law in nature is declared to be a demonstrated fact for those who live always in accord with it. Admitting its existence, for argument's sake, it probably has its foundation in the Eastern concept that all life is one.

By this time perhaps some one may impatiently exclaim, "What has all this goody-good stuff got to do with the prevention of middle age?" In this way: have you ever seen a grasping, selfish, miserly person who was truly happy and free from worry or care? Such a person lives by the rule of *getting* instead of giving; getting by any means within the law, without caring much for the feelings or rights of others. Not being in the habit of giving anything for nothing, he knows he cannot expect favors from others. He knows that many would be glad to deprive him of his gains, and that in case of serious trouble he could not depend on the slightest friendly help or advice. He has no one he could depend on but himself. He is not always sure that he is sufficiently on guard, and he lives more or less in a state of fear of impending losses.

In several parts of this book it is shown that chronic fear is one of the most destructive of emotional states, undermining digestion and nutrition, and tending to induce chronic constipation—from which comes auto-intoxication, from which comes premature hardening

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of the arteries—the first stage of aging. Fear is the child of selfishness, and both go along together in fitting companionship.

On the contrary, unselfishness, confidence, and optimism go naturally together. Optimism is a grade of happiness. All modern physiologists know that happiness tranquilizes the subconscious mind, increases appetite, promotes nutrition and elimination, and maintains the body in health and efficiency. Will any one with a modern education now ask what selfishness may have to do with hastening middle age?

Summary. All organic life is subconscious life. Our subconscious mind consists of the aggregate cellular and organic consciousness of the body as a whole, plus all impressions, beliefs, desires, and memories accumulated during life. The subconscious mind is the builder and preserver of the body, and the engineer who coordinates its functional activities.

It believes anything it is told or impressed with, true or false. It is ruthless, self-centered, and unmoral. Normally its dominant bent is self-preservation; but under the influence of fear and destructive beliefs it acts like a frightened child, or a horse in a stable on fire, accepting self-destruction as inevitable. Under discipline and harmony it is a splendid servant, but when beyond control it is a demon of cruelty and destructiveness.

It governs the automatic functions of the body, and

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when let alone in natural conditions will always maintain physical health.

When the subconscious is definitely impressed with the belief that middle age and its stigmata will appear at about forty-five, it then coöperates with and coordinates all injurious influences, and at about forty-five begins to brand the body with the marks of middle age.

When the subconscious, through an enlightened conscious mind, is sufficiently impressed with a conviction that aging is not inevitable but preventable, it seizes on the new and constructive idea and soon acquires a positive momentum toward self-preservation during the middle years, with the result that the usual signs of middle age do not appear at the appointed time.

The Higher Self. Whatever one may have developed of goodness, unselfishness, nobility, and the like shows out wholly through the conscious mind. But its higher and finer impulses are often thwarted by selfish unsocial impulses from the subconscious, which for the most part are entirely unsuspected by the higher self. One's place or grade in social evolution is therefore entirely a matter of control of the subconscious, or lack of such control, by the higher self.

Conclusion. It should be clearly understood that this chapter includes only an outline of *some* of the most important of the protean aspects of the subconscious mind. Furthermore psychology is a much bigger

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thing than that which is usually connoted under that name. It includes the entire and limitless field of consciousness and life in their widest aspects, and the philosophy of the evolution and involution of consciousness. If any one science can be truly said to be greater than others, then psychology—the wider psychology and its philosophy—is that science.

CHAPTER VII

PSYCHOLOGICAL INFLUENCES

The present chapter will take up the profound influence, for good or evil, that the habitual character of one's thought and emotion has on the preservation of youth, strength, and beauty, and, conversely, on the premature onset of old age, with its dreary accompaniments of tendencies toward the constitutional diseases of middle life, the menopause, and gradual deterioration in all directions.

Up to a generation ago the influence of psychology in health problems was almost unknown. Now, however, psychology ramifies in every department of medicine, and in that of the neuroses it has practically superseded all other attempts at treatment.

In the last few years Cannon of Harvard, and after him others, have carefully and minutely studied the effects of emotional influences on bodily functions, and their remarkable work has definitely settled all materialistic doubts on that question. Their results gear perfectly with earlier and contemporary work done by the great psychologists, Freud, Jung, Hall, Jelliffe, and others, and also with the marvelous experiments in hyp-

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notism. All this has shown, among many other things, the futility of medical and surgical treatment alone in diseases whose causes are largely psychological.

The Subconscious Mind. The background of consciousness is the subconscious mind. It is also called by different writers the unconscious, the subjective mind, the deep consciousness, the subliminal self, and the desire elemental. The expression "subconscious mind" is often used very loosely, and with conceptions varying from sub-animal consciousness to the highest super-consciousness. I am tempted to coin another and I think better name, but for the present book shall stick to subconscious mind, as giving probably the nearest connotation of the *idea* I want to put across the threshold of our ordinary consciousness. The subconscious mind then controls digestion, nutrition, and elimination through the medium of the sympathetic nervous system, whose countless fibers are as sensitive to its vibrations as are the strings of a harp under the fingers of an artist.

Mental and Emotional States. The subconscious mind is dominated by our habitual mental and emotional moods. If those moods are harmonious, then digestion, nutrition, and elimination go on automatically and in perfect equilibrium. If our moods are habitually discordant and morbid, our subconscious mind then becomes, so to say, full of cross-currents which send irregular impulses along the sympathetic nerve fibers and disturb the normal equilibrium between digestion,

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nutrition, and elimination. The poisonous products of modified digestion and of constipation then enter the blood.

To emphasize the workings of the subconscious mind I shall first refer to some frequently seen bodily disturbances of obvious emotional origin, and then go to the far more important chronic conditions whose emotional causes are not usually apparent except to students of psychology.

Acute Emotional Reactions. One may be very hungry and ready to sit down to a good meal. A telephone message or a telegram brings bad news. The fine appetite of a moment before is gone. The smell of food, even the thought of it, may now cause nausea. In such a case the brain transmits a disturbing impulse to the sympathetic nervous system which stops the secretions of the mouth and stomach, which normally take care of the food chewed and swallowed.

Again, the bad news may not come until just after a hearty meal. The food then feels like lead in the stomach, and may cause nausea or even vomiting. The explanation is that the disturbing impulse from the brain through the sympathetic stops further secretion. The mass of food then acts as a foreign and irritating substance, becoming in fact an emetic, which stimulates the muscular fibers of the stomach to contract suddenly and expel the irritating material.

Sudden danger may cause involuntary action of the lower bowel and bladder. It has long been known that

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soldiers going into their first battle sometimes have involuntary bowel movements, a condition said to be known in the underworld as burglars' diarrhea.

Another effect of sudden danger is to make the mouth and throat dry, by temporarily checking their normal secretions.

Probably the commonest of all acute emotional reactions on the body are rapid heart-beat, blushing, and pallor—inspired by fear, anger, or embarrassment—all of which mean, physically, expansion or contraction of the minute arteries of the skin.

A convincing test of the action of mind over body is the somewhat threadbare practical joke where five or six men agree to meet another man next day, one after another, and each to tell him he is looking ill. The victim usually laughs at the first plotter, listens to the second, feels queerly after the third, feels ill after the fourth, and after the fifth goes home and sends for a doctor.

Evidence from Hypnotism. Many remarkable examples of the control the subconscious mind has over the tissues of the body have come from hypnotism. The skin may be made insensible to needle, knife, or fire. It may be made to blanch to snowy whiteness, or to congest with blood until drops exude from the surface. Enormous muscular power may be conjured up, as when a girl rests with her head on one chair and feet on another, and two heavy men sit across her body,

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which remains rigid without the slightest conscious effort.

Fear and Infection. Medical and common experience teaches that when sick people lose hope and are sure they are going to die, they generally do die. It is known also that extreme fear of disease predisposes to infections. An impressive example was that of a bacteriologist whose work was for a time among lepers. He soon conceived an intense and almost irrational fear of leprosy. He spent much of his leisure in examining his own secretions, in constant dread that the germ of leprosy would at any moment appear under the microscope. He took infinitely greater precautions than doctors deem necessary, but eventually he became a leper. •

The Italian people seem to have an intuition about the proper treatment after an emotional shock, or *impresione*, as they call it. The treatment is very simple and consists only of a purge, which is quite the rational thing to do, as it gets rid of most of the poisonous shock-products before they have time to seep into the blood stream. In general also the Italians have a remarkably wide knowledge of practical medicine, and consequently they are much freer than Americans are from chronic constipation, indigestion, appendicitis, and neuroses.

Chronic Emotion Reactions. We now come to the most important aspect of this part of our subject.

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It is common observation that long-continued grief, anxiety, or grave and thankless responsibility will cause people to age quickly. Most of us have heard, and perhaps concurred in, such remarks as, "He has aged ten years since his son died," "Her hair turned gray in three days," "The responsibility is aging him." Impressive and convincing examples of such physical wear and tear and premature aging were shown in the "Literary Digest," in September, 1924, in the pictures of Presidents Harding, Wilson, and Roosevelt before and *after* their terms in the White House. There is indeed positive evidence, according to Lorand, that young people have become gray in one night. And what is grayness but a precocious symptom of old age?

Emotion and Nutrition. Continuous worry, fear, grief, anger, hatred, irritation, or humiliation usually brings about impairment of appetite for food, increased craving for condiments, stimulants, or drugs, and sooner or later states of chronic indigestion and constipation. Furthermore it now appears that many grave cases of ulcer of the stomach or upper intestine are definitely the results of long continued emotional stress, such as financial anxiety or domestic unhappiness. The following example seems to be a case in point:

A prominent business man, long under severe financial stress, gradually developed chronic indigestion, and finally ulceration of the stomach and small intestine. He had formerly been in very good health and had no bad habits except moderate smoking. He was operated

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on by an expert surgeon, who found besides the ulcers a bad chronic appendicitis and a diseased gall-bladder. The appendix and gall-bladder were removed, and the stomach was connected with the intestine beyond the ulcers, relieving them from pressure irritation from food. After recovery from the operation there was an interval of good health, and also better business developments. But financial troubles and anxiety came again, and with them return of all the old symptoms, and *that* after removal of a diseased appendix and gall-bladder, and after short-circuiting of the ulcers!

Tranquillity. One of the beneficial effects of a tranquil disposition is that it increases one's resisting power to better endure and to survive shocks, such as grave injuries or severe surgical operations. Some recent experiments on animals made by Hammet of Wister Institute are interesting in this connection, though they were undertaken for another purpose. The work is quoted at length by Slosson in "Keeping Up with Science." Boiled down, it amounts to this:

The parathyroid glands of a number of rats—304—were removed. The idea was to find out how long they would live afterward. Some of the rats were wild and some were tame. The tamed rats were naturally very much easier to handle and to put under an anesthetic. They were not afraid and scarcely resisted at all. But the wild rats were just the reverse. It was found that the tamed rats lived much longer than the wild ones after operations. While 79 per cent

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of the wild rats died soon after removal of their parathyroid glands, only 13 per cent of the tamed ones died.

These observations have their parallel with human surgical experience. No surgeon likes to operate on any one who is in a state of fear or panic, because he knows that the chances for success and recovery are not nearly so good.

Neuroses. Under the names "hysteria" and "neurasthenia" come a host of cases of infinite variety, showing multitudinous disturbances of physical functions, but without demonstrable physical diseases to account for them. Most of these are now positively known to be due to abnormal repression of what are called the great natural urges striving for expression. It can hardly be put down to coincidence that most of the authentic cases of great age, along with retention of the characteristics of youth, have been those of married men. Some of them were married three or four times. "As a rule," says Lorand, "celibatarians show symptoms of old age much sooner than married persons." These facts fit in perfectly with the conclusions of psychology; namely, that reasonable satisfaction of the great love urge is essential to the welfare of every normal individual and of every progressive race. I cannot go further into this interesting subject here, and only mention it as collateral evidence of the enormous power of the mind and feelings over the health and efficiency of the body.

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The slowness and even apparent reluctance of many doctors to consider psychological influences in medicine has been most regrettable, particularly for many of their patients. The profession has mostly itself to blame for the widely spread influence of cults which have invaded medical practice. These cults use psychology, and therefore often get surprising results—as do also the relatively few doctors who have studied psychology. The ostrich attitude of the profession is beginning to break down, however, and many are now lifting their heads from the sand and looking about them. But: “It has required a long time for orthodox medicine to accept what has been known empirically for centuries that emotional factors are capable of producing acute as well as chronic structural alterations (so-called organic disease) as well as being constantly operative in causing so-called, and badly so-called, functional diseases. The study of the vegetative system (a new and technical name for the sympathetic nervous system) has enabled this gap in knowledge to be bridged by showing the exact mechanisms by which these structures, coöperating with certain of the endocrinous glands, may produce pathological conditions.”¹

In the same masterly work² the authors say, “Further than this, purely emotional causes if severe or of long duration may produce structural changes from

¹ Jelliffe and White, “Diseases of the Nervous System,” p. 122.

² Page 788.

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which recovery is very slow or impossible, or may precipitate, by affording favorable conditions, severe, even fatal infections."

I will end this chapter with a quotation from the writings of a singularly sensitive and advanced mind of the last century who anticipated by many years the epoch-making psychoanalysis of Freud and the mental philosophy of Troward, without consideration of which the mere medicinal, diet, and rest treatment of many serious conditions is little better than practical joking :

The principal grievance I have against the doctors is that they neglect the real problem, which is to seize the unity of the individual who claims their care. Their methods of investigation are far too elementary; a doctor who does not read you to the bottom is ignorant of essentials. To me the ideal doctor would be a man endowed with profound knowledge of life and of the soul, intuitively divining any suffering or disorder of whatever kind, and restoring peace by his mere presence. Such a doctor is possible, but the greater number of them lack the higher and the inner life; they know nothing of the transcendent laboratories of nature; they seem to me superficial, profane, strangers to divine things, destitute of intuition and sympathy. The model doctor should be at once a genius, a saint, a man of God.³

³ Henri Frédéric Amiel, "Journal intime," August 22, 1873.

CHAPTER VIII

PSYCHOLOGY AND MODERN PROGRESS

The demonstrations made by psychoanalysis and hypnotism of the powers in the subconscious mind and their paramount influence in many disease conditions have, so to say, erected an eminence from which scientific vision can penetrate into regions that were formerly unthinkable. In psychology for example certain abnormal mental attitudes and physical conditions are seen to be mere expressions of certain long-continued impressions or complexes in the subconscious. Furthermore the same origin is found to be true for the ordinary or so-called normal attitudes toward morals, religion, politics, and so on. It has been found that for the masses nearly all of their so-called opinions, beliefs, and convictions are but echoes from early impressions or complexes indelibly fixed in their subconscious minds by parents, teachers, or priests, with hardly a spark of reasoning in any of them.

Negative Beliefs. Psychoanalysis has definitely proved that the subconscious mind faithfully reproduces *in our bodies* all continuous morbid states of mind and emotion, and all settled convictions of inferiority.

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Now that science is beginning to regard senility as not so much normal involution as chronic disease, we have before us this proposition : all chronic diseases are more or less influenced by fixed subconscious impressions.

That even cancer may be so influenced will seem ridiculous in the extreme to medical men unfamiliar with modern psychologic thought. But if, as recorded by Mesmer's pupil, Mesmer actually cured some cases of cancer by keeping patients under prolonged hypnosis for weeks at a time, with brief waking intervals for feeding, there can be no other explanation. It is only fair to add, however, in the interest of truth, that a positive diagnosis of cancer is always open to reasonable doubt in all old cases reported before the advent of the modern high-power microscope. Hence there is always the possibility that some at least of Mesmer's patients were not true cancerous cases. But however that may be, the following modern case points strongly in the direction of subconscious influence, although I cannot vouch for it, as it was told to me by another doctor who got it second-hand. But such as it is, it is entirely consistent with the general theory of the action of subconscious fixation on deep tissues under the influence of hypnotism.

A woman of about thirty developed a swelling on the side of the face. She consulted a surgeon connected with a well known university. Microscopical examination of a fragment of the swelling showed it to be malignant. It was cut out but soon began to grow again.

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Several operations were successively performed, but the tumor always recurred, and at last it had ramified so deeply into the face and neck that further operations were hopeless. The patient was frankly told the situation and advised to set her affairs in order, as she could not expect to live more than a few months longer. The surgeon thought no more of the case until about three years later, when his former patient called on him. He could not believe at first that she was the same woman whose death-warrant he had read three years before. But she convinced him and showed the old whitened scars of his own operations. In answer to his amazed questions she told him that after he gave her up, a friend who claimed to be a psychological mental healer got permission to try to do something with her. As the patient had nothing to lose, she resignedly submitted herself to the new treatment. The healer apparently took a deep personal interest in the case and set out to do the best she could. She arranged for the coöperation of two other healers, and between them they kept the patient continuously under the treatment for several months. In the end, the tumor shrank and at last disappeared, and for more than two years there had been no symptoms of recurrence.

Such a result will appear as incredible and impossible to medical men who are not somewhat versed in psychology, as will the transmutation of the metals to chemists who are ignorant of the electron theory and the work of Ramsay and Soddy. But incredulity does

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not affect the working of natural laws—except as they may apply *in our own bodies*. The psychology of the apparent cancer cure is actually simple, and is nothing but an extension of the universally known vasomotor phenomena of blushing and blanching. Malignant tumors must live, like all other tissue. They get their nourishment from small blood-vessels which ramify within their substance. The caliber of all blood-vessels varies under sympathetic nerve control, and sympathetic nerve control is influenced by subconscious impressions. The skin can be blanched to death-like whiteness by hypnotism; which means that the caliber of its minute blood-vessels is so reduced that practically no blood corpuscles can pass through them. If so with the normal skin, why not with the blood-vessels of a cancer? The mechanism of both is exactly the same. If constriction of the nutrient blood-vessels of the cancer could be maintained for a certain time, the cancer would die, shrivel up, and the patient would get well.

Here then is the simple, rational, psychophysiological explanation of the cure of a case of cancer by the fixation of a positive therapeutic impression in the subconscious mind. Marvelous and incredible, like radio—but only when not understood.

Such results might be frequently duplicated by hypnotists, *if they believed they could get them*. But even workers along the most progressive lines usually set up imaginary limitations which they believe they

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cannot exceed. Example: many years ago I asked a doctor who was a powerful hypnotist if he could treat malignant tumors by means of hypnotism. He replied instantly, "No; that is impossible." The psychology of the matter had not then been worked out, and this doctor-hypnotist merely echoed the general medical opinion then held that cancer was incurable except by early operation. As the belief in a limitation often constitutes such a limitation, this surgeon, and others, could not and cannot do anything which they have previously made up their minds to be impossible. Perhaps it is well for society, however, that most of the people who have developed hypnotic power do so limit themselves!

Returning now to our original subject of aging, we come to what we believe is the most important contribution in this book—the relation of senility and the climacteric to subconscious fixations. If chronic diseases, even cancer, are or can be influenced by subconscious fixations, then why not also senility and the climacteric? They are conditions representing progressive physical inferiority, and for countless thousands of years nearly every one has held settled convictions as to their inevitability. Here then we have examples of the most complete and habitual negative impressions fixed in the individual and racial subconscious mind, and backed up by what seems to be the authoritative and invariable experience of an immeasurable past. If

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there is anything at all in analogies, such typical negative beliefs must have a profound bearing on the whole question of longevity.

For a concrete example, most of us in Christian countries have had dinned into our ears since childhood, in church and at funerals, the tenth verse of the ninetyeth Psalm: "The days of our years are threescore years and ten; and if by reason of strength they be fourscore years, yet is their strength labour and sorrow; for it is soon cut off, and we fly away."

In these words from an ancient Hebrew writer in our Christian Bible we have, crystallized and formulated, the most hopeless negative suggestion as to a practically fixed age for man. Such formulated negative suggestion, frequently repeated, cannot fail to register subconsciously among steady church-goers, and must surely go a long way toward making their age limit a matter of self-determination.

No passage in all the literature of the world has had such influence as Psalms 90:10. It is pathetic to see how incessantly this passage is quoted in the literature on old age, and how not only among the Jews but perhaps quite as much, if not more, among the Christians, bibliolatry has made it accepted almost as a decree of fate.¹

The best way to counteract the bad effects of this block of negative suggestion is to substitute for it strong and positive suggestion based on facts to the

¹ Stanley Hall, in "Senescence," p. 52.

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contrary. The facts are: (1) the average duration of human age in Europe in the Middle Ages was twenty-one years; (2) in the United States in 1915 it was forty-eight years; (3) in 1925 it had risen to fifty-five years; (4) in Bulgaria with a population of 7,000,000 there are about 3,700 people over 100 years old, as against Germany with 61,000,000 and 71 over 100 years. These cheering *facts* should be called to mind and reiterated whenever Psalm 90:10, or like authoritative negative opinion, is mentioned.

Facing Backward. One of our greatest limitations in every way is our blind belief in the past as a sure guide and rule for the future. In that view, what has always been must always be. Note the paralyzing influence of ancestor worship in China and the caste system in India. Men lived mostly by that rule for ages, until the dawn of modern science broke the intellectual sleep of the race, and one by one the inhibitions of the past. Not so long ago many well read people accepted the shallow definition of Hume as to what was possible or impossible. The gist of it was: "A miracle is something that never happened before." If the poor man had lived till now he would have felt rather uncomfortable in an age of "miracles" according to his own definition.

Facing Forward. Reliance on the past is the hindrance of the future, except the past be thought of as a few lower rungs of a ladder of infinite height. Up to one hundred years ago the trained intellect of

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man had not been turned to mechanical science. But when it was, it soon became "a personal factor in evolution" which achieved the impossible and miraculous by past standards—more in that one hundred years than in all previous historic time. Therefore the experience of all past time as to the aging of men and animals proves nothing more than that senility is the inevitable course of *unaided* nature.

Recent investigation of the causes of senility has found them to be both physical and psychological. Further study has ascertained that both groups of causes are apparently almost wholly preventable; and if causes are preventable, it seems that conditions should be! There is now enough evidence to take aging out of the class of normal or physiological epochs and place it where it belongs—in the list of *chronic diseases*; indefinitely preventable if realized and treated early enough, arrestable as far as it has gone, and even to some extent improvable when already advanced.

The possibilities arising from these studies are so contrary to all past experience that at first thought they seem staggering and incredible; hardly less, indeed, than the modern realization of the alchemists' dream of the elixir of life. But there it is—in terms of chemistry and physics, of medicine and surgery, of cause and effect, of prevention and to some extent even of cure!

Animal Analogies. But how about advancing age in all animal life? some will ask. *Their* subconscious minds are not troubled, so far as we know, with chronic

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emotional depression and financial worries; and yet old age comes at last to all of them.

Let us see how we can answer that question. In the first place the relative duration of an animal's natural life as compared with its period from birth to maturity is usually several times longer than with man. This fact is still more emphasized in birds, reptiles, and fish. Moreover some reptiles continue to grow all their lives. In the second place, animal analogies hold good only as far as they go, and that is not always as far as we have been in the habit of believing. To illustrate: the physiologists of the last generation thought and taught that morphine acted on dogs, weight for weight, as on man, and some of their descriptions of the action of this drug on man were based on animal experimentation. But Cobb of the U. S. Public Health Service afterward proved that dogs could not be killed or even much affected by injections of sixty grains of morphine sulphate into the jugular vein.

Again: contrary to popular opinion, the lives of most animals are not models of natural or hygienic living. When young they fight frequently and furiously. They suffer privations and exposure at times, and at others eat ravenously, often of tainted food reeking with maggots, bacteria, and their poisons. They eat almost without chewing, and swallow indigestible substances like bones and feathers. Furthermore many of them are chronically infested with skin diseases and intestinal parasites. I have a vivid remembrance of seeing an

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out-of-door Western dog vomit up a very large and long tapeworm, and then, after resting a few moments, eat it all again to the last segment in ancient accepted dog fashion, and with much apparent relish.

Another thing: wild animals seldom live to old age, and generally die violent and premature deaths. Domestic animals deteriorate, become senile, and age as do human beings.

Man and Nature. Animals are incapable of adapting nature to their uses to any new extent. The apparent exceptions are ants, bees, and beavers, but their ways do not materially change or improve. To be sure, dogs, cats, horses, hogs, cattle, and even chickens have adapted themselves to automobiles to the extent that horses hardly ever shy at them any more, and the other animals do not get bumped or run over nearly as often as at first. It is his capacity for improvement and infinite resourcefulness, building on the accumulated knowledge of the past, that marks man as immeasurably different from and superior to the highest of the animals.

Man is changing the old and established order of nature every day and in every way. For example, iron cannot float, and yet man now makes ships of iron. Men have no wings, yet now they fly; though it is said that up to 1904 the U. S. Patent Office refused to consider applications for patents on flying-machines, as being the conceptions of cranks or lunatics.

In preventive medicine man has repeatedly changed

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the old order of things. Smallpox had periodically scourged the world for ages, and would have kept on doing so indefinitely, if science had not turned its attention to it, and for the time practically wiped it out. Unfortunately, however, the terrible lessons of the past have been largely forgotten under long years of comparative immunity, and vaccination has been more and more neglected until, with something of a shock, it is realized that smallpox is again becoming a grave menace.

Goiter went on for centuries in certain Swiss cantons and was thought to be endemic and inevitable for a majority of the inhabitants. But a few years ago science studied the matter and soon found the cause and the cure.

Venereal diseases were, and still are, thought of by many good people as God's or nature's penalties for sexual irregularities. But the exigencies of the World War demanded men physically fit, whether they were Sir Galahads or satyrs. So science turned its searchlight on that tabooed subject and soon found that all venereal infections were largely preventable, and for a time it was allowed to tell the men how to protect themselves.

The New and Old Orders. One of the most remarkable things in all previous history and experience is that man's capacity for improvement in the adaptation of nature into new channels lay almost dormant for ages—until the present age of machinery began,

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less than one hundred years ago. Physical material conditions had hardly changed at all during thousands of years.

Looking at the subject in this way we see that as man during thousands of years did not avail himself of his latent powers to adapt the courses of nature to his desires, his relation to physical nature during all that time hardly varied more than that of the ants, bees, and beavers.

Contrast with this long and almost changeless period the innumerable changes that have taken place in the last one hundred years. Imagine the surprise, the bewilderment, of a man who, like Edward Bellamy's hero, went to sleep in 1825 and woke up in 1925!

When we remember that virtually all of man's new equipment and his increased powers in collaboration with nature have come during the brief period of one hundred years of awakened and applied intellect—within the span of one long lifetime—it would be most surprising, now that the capacity to enjoy is so much extended, if a portion of this intellectual tide were not turned to the nobler and more glorious purpose of finding the causes of aging and the ways and means to avoid or to remove them.

CHAPTER IX

THE CLIMACTERIC

The climacteric in women is one phase of the beginning of aging. But its effects on the social and emotional lives of women are so profound, and its beginnings seem to ramify so deeply into the evolution of the racial psychology, that some space will have to be given to its study. It will be shown in the course of this chapter that an understanding of the rationale of the climacteric or menopause is absolutely necessary in order that its prevention and treatment may be scientifically possible. Let us, therefore, examine the whole question with open minds, free from the bias of prevailing and preconceived notions, and with nature as our background.

There are certain recurrent events in nature which we have learned by experience to regard as invariable and inevitable, such as sunrise, sunset, the tides, the phases of the moon, and the seasons. About the coming of these events there is no doubt in any mind.

In the field of purely human experience we have one other inevitable certainty—death—and two conditional certainties—change of life and old age. All men and

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women believe with absolute conviction that, provided they live long enough, they will in both sexes deteriorate into old age, which in the one sex will be preceded by the dreary interlude of change of life. Almost all women then are as absolutely convinced that they must go through that ordeal as they are that the sun will rise and set.

Another curious thing, not generally known, is that change of life is not limited to the female sex, but often has its correspondence in men also. I shall refer to this later on.

"The years of the climacteric," says Lorand of this tragic period for women, "are the most troublesome in married life, not only for the wife, but also in almost equal degree for the husband, who must show the greatest forbearance to his wife at this period. The sun is setting! It is not merely that the decline of the sexual functions produces certain changes in the body, which are especially noticeable in the external appearance; the influence on the mind also produces deleterious effects."

And again: "This stage of human life is most felt by professional beauties, who witness with chagrin the vanishing of their power over the hearts of men. In many spinsters living alone, friendless, this is also a frightful stage of life."

A masterly portrayal of the latter is the confession of the middle-aged single woman in "Black Oxen." This part of the book has been a severe jolt to prudes, puri-

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tans, and others emotionally starved and repressed; but it is a true echo of the silent and more or less subconscious wail of untold thousands of women whose love natures have been thwarted and whom life has neglected and passed by.

In order to understand what change of life really is, it is necessary to refer briefly to recent studies in hypnotism, psychology, and psychoanalysis, which reveal the tremendous part taken by the subconscious mind in all bodily functions. Thus, *impressions in the subconscious affecting health, if definite and persistent, will always manifest later physically.* It is common knowledge that repeated suggestions of fear and sickness make us more susceptible to infections. I shall cite two instances of what subconscious impressions can do with physical bodies, and then take up their bearing on the climacteric.

A condemned French criminal was given the choice of death by beheading or by bleeding from a vein. Naturally he chose the more humane and painless way. He was taken into an operating-room and laid on a table, by which were surgical instruments and a basin for receiving blood. He was given absolution, and then his eyes were bandaged. A surgeon now made a slight cut on his wrist, but without opening a vein, and then let warm water trickle down the hand and drip into the basin with a distinct sound. The criminal gradually became unconscious, and—died!

Björnström, a Scandinavian authority on hypnotism,

reported a case where a hypnotized subject was told that blood would soon burst from his arm. The skin was seen to get redder, until drops of blood began to exude.

The results of these two experiments are most significant and demonstrate in an impressive way the power of the subconscious mind over the body when holding absolute convictions as to things that are to happen; in the one case by means of hypnotism, in the other through the waking consciousness.

Bearing these two experiments in mind, let us now return to the physiological phenomenon of change of life. As has already been said, nearly every woman feels absolutely sure that she will experience the condition for several years, somewhere about the middle life, and with more or less of distressing symptoms which will affect her health, efficiency, moods, and married happiness. Feeling *absolutely sure* of this, without a shadow of doubt, her subconscious mind is deeply and powerfully impressed and will do its best to manifest the complex in full detail at about the expected time.

It is the so-called exception that helps to prove the rule I am claiming for the menopause. A few very intelligent women I have known have had the sense to resist the almost universal negative conclusion as to change of life. They either have taken the position that it should come about gradually and almost imperceptibly; or better still they have ignored it altogether. These women have had and are having no

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trouble at all, either physically or mentally. One of them, at sixty, looked hardly more than thirty-five and was still so attractive that men on the street would turn around and look after her. Another handsome woman, the mother of five nearly grown children, looked about thirty-eight but admitted to me confidentially that she was fifty-two. In Chapter IX a still more remarkable case is mentioned of a woman sixty-nine years old who has had twelve children, still menstruates, and looks about forty-five.

Here is another case of a woman who refused to accept the common fate. For several years before forty-five she began to think a good deal about what would soon come, and with more or less dread. Then the thought came to her to transmute sexual force into mental effort. She was intellectual and went into psychology and sociology in earnest. The new work became so absorbingly interesting that she hardly ever thought about the other thing any more. Forty-five came and went, and nothing happened. At fifty-two the periods ceased abruptly, without any other symptoms whatever. Three years have passed, and nothing else has happened. Although in this case the function stopped suddenly instead of fading away, it supports our argument that a correct mental and emotional attitude at that time prevents all disagreeable symptoms.

Still another case of the same sort is that of a woman of forty-two, very happily married, who began to dread

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the climacteric, mainly on account of its expected deadly effect on her married life. An intelligent woman friend happened to be near her while she was glooming over her impending fate. She told the friend of her secret dread. This friend, like the woman of the previous case, had somehow got hold of the idea of transmutation of sexual force into mental energy.

"Your husband is a physiologist," she said. "Start right in and study physiology with him."

"Oh, but I don't know anything about it! And anyway, how could that put off the inevitable?"

"Just try and see for yourself," said the friend. "I know what I am talking about. Intense mental study and interest carried me through that period without any trouble at all."

The other woman tried—and succeeded. The dreaded epoch passed without any symptoms to indicate that anything unusual was going on. The married life went on as before. And now, years after the event, the husband and wife are as happy as if nothing had ever happened.

To return to men: a kind of climacteric often comes to them about middle life in the form of depression and even severe melancholia, and with tendencies toward chronic constitutional diseases and decline of sexual power. Here again we find a negative mental attitude of expectancy which parallels that of most women toward the menopause. Men in general, and the sporting class in particular, hold strongly to the notion that

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sexual vigor always begins to decline toward middle life. Their subconscious minds have been more and more impressed with this kind of thought for many years. Such long-continued negative suggestion must infallibly result in the expected loss of efficiency at about the self-appointed time.

As in women, the exception again proves the rule. Men of intelligence who reject the ordinary view, and who have lived sanely and hygienically, do not fail sexually at the period of life when average men do. I have known several such men, two of them over seventy, the case of one of whom is described in Chapter I.

Modern science, in demonstrating the subconscious mind and its complete response to suggestion, has given to the world—or to all who have vision enough to use it—the knowledge which can liberate it from much of the limitation that now oppresses it through disease, change of life, and premature old age. The faith that can move mountains is no mere figure of speech in physiology but one of the most important scientific facts in life. In sum, we know now that the maximum of individual and social destruction can be wrought by widely diffused and negative thinking and by false teaching and false beliefs. Conversely we know that the greatest benefit and happiness can and must result from optimistic and constructive attitudes toward life.

The evolution of the change-of-life boggy may be assumed to have begun during the early ages when

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women were owned by men and were valued only as breeders and instruments for men's pleasure—to be thrown aside whenever their fancy changed. As the primitive tendency of men is always toward youth in women, so in those early days when a wife had passed her first youth her lord and owner usually sought a younger woman; and of course the discarded woman felt anger, humiliation, grief, and hopelessness.

Gradually through untold thousands of years of such cruel experience the female subconscious mind would become impressed with the conviction that after her youth was gone a woman would cease to be attractive or desirable to men. In that time there was virtually no education or mental culture, and so, as woman's mentality counted for nothing, her only asset was her sex in youth. When her youth passed she felt with absolute certainty that she was finished, played out; and with that conviction came a sense of *inferiority*.

Now one of the most definite things we have learned from the new psychology is that persistent feelings of inferiority deeply impress the subconscious mind, and sooner or later show forth objectively and destructively in the body. It is therefore easy to understand that a settled and definite conviction of sexual inferiority, to come about a certain time, impressed age after age on the racial female subconscious mind, must inevitably result in bodily reactions corresponding to the negative ideas accumulated in the subconscious. Those reactions occur therefore in the sexual regions of the body and

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in exact accordance with the autosuggestion of sexual deterioration and inferiority; namely, premature cessation of the periodic function, loss of beauty and attractiveness, and painful and otherwise annoying sensations that correspond with premature interruptions of other natural processes.

A very striking though quite unconscious piece of testimony, as to the negative and fixed expectation in most women's minds about the climacteric, is given in a recent and well written book which claims to be—and probably is—the autobiography of a *prima donna*. When she approached the age of forty-five she says that she began to be haunted by the fear that her voice would soon break. On her forty-fifth birthday it so happened that she was singing in grand opera at Covent Garden in London, and on that fateful night the long feared and confidently anticipated break in her voice occurred.

In the history of grand opera it is common to find women still at the height of their singing capacity, and still of pleasing stage presence, when well past fifty. Such women have either not yet reached the climacteric, or it has come and gone without their letting it disturb them, which by every analogy should be nature's true and preferred way. They had somehow not been obsessed by the prevailing foreboding of women. But the singer who writes of her growing dread that her voice would break—she does not of course say at her climacteric, but that is what she means—was so much

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obsessed with the finality of the expected catastrophe that her subconscious mind timed it exactly with her forty-fifth birthday—the pivotal year that woman's racial negative anticipation has fixed for her sexual counting out.

The extraordinary case of Karoline Ollson, reported by Dr. Todenström in 1912, supports not only our subconscious racial complex theory in regard to the climacteric, but also our conclusions as to old age and diet. Karoline was born in Sweden in 1861. At fourteen her first menstruation came. One day soon afterward she complained of a toothache and went to bed and fell asleep. Next day she woke up and drank a glass of milk, then fell asleep again. After this she slept day and night. She would waken every day for a few minutes, take two glasses of milk, answer questions in monosyllables, scarcely notice what went on in the room, and then go to sleep again. She remained thus bedridden for *thirty-two years*. Her climacteric occurred early in 1908, and in April of that year she woke up, got out of bed, went to work, and thereafter led a normal life. Though now what is usually called a middle-aged woman of forty-six, she looks like *a very young girl*.

Psychologically this was a case of flight from reality. For some unknown reason when a school-girl she had developed a subconscious fixation of dread or repugnance to facing womanhood and its responsibilities and penalties—to menstruation, childbirth, and the climac-

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teric. She, like the opera singer, had taken it as a matter of course that her climacteric would come when she was forty-five. She wanted to remain an irresponsible child. She had a Peter Pan complex—to coin a new one. The only way in which she could achieve this was by going to bed and staying there; and the only way in which she could get herself permitted to stay in bed was by sleeping so soundly that she could not be awakened. The subconscious mind is quite unmoral and utterly self-centered. When it definitely desires something, it is absolutely ruthless and indifferent to every other consideration. This girl's waking consciousness was not strong enough to inhibit her subconscious desires, and the latter took full control of her personality and kept her body deeply asleep during the entire active sexual period of her womanhood.

Here we have a case in which the climacteric was passed without any inconvenience or conscious realization of it. During the thirty-two years of her maturity she had no mental or emotional stress. Her diet was simple and scant but ideal, milk being a perfect food in itself. Consequently, at the end of her thirty-two years of vegetative existence, with no stress or wear and tear of any kind, her body remained just about as it was when her subconscious mind laid it up in cold storage, as it were, thirty-two years before.

The following case bears some resemblance to the last one cited, and has not before been reported. Its interest is mainly psychoanalytic, but, like the case of

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Karoline Ollson, it emphasizes certain points, physiological and psychological, as to prevention of senility, and for those reasons it is put into this chapter.

L. D. was a girl of highly sensitive and intellectual make-up. She had been brought up with rather puritanical ideas as to purity and morality. When eighteen she was married to a "man of the world" in the crude sense of what that connotes. His idea of woman was mainly that of an instrument for man's pleasure. He knew nothing whatever of love as an art, and was apparently quite indifferent whether his advances were reciprocated or not, provided he derived personal satisfaction from the legal exercise of his "rights." It is easy to realize what such a marriage meant to such a girl—especially as her mother's marital experience had been unsatisfactory and even repellent, and had been told to the daughter a day or two before her marriage.

The wedding night was an experience of horror and physical suffering, and the honeymoon a protracted nightmare. At last the young wife broke down and went to bed, where she remained about three months. Among her symptoms were agonizing pains in both sides of the lower abdomen and a vaginal discharge—which, when taken together with a *honeymoon*, means to a doctor just one thing, gonorrhea and tubular infection communicated by the husband, a souvenir from his bachelor days.

As soon as the wife felt able to rise from her bed,

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the husband again demanded and took his legal "rights." After another interlude of horror and suffering the wife once more broke down and went to bed for another three months or so. And thus it alternated for several devastating years for the wife until she could not endure it any longer, and thereafter she practically stayed in her sick-bed for nearly three years. By this time the husband decided that he did not want an invalid wife and deserted her without any support. The wife was then taken care of by relatives, and she remained a practically bedridden invalid for the next twenty-one years. During the early years of this period the chronic gonorrhea wore itself out.

At the age of *forty-five* she felt well enough to leave her bed and get about, and began to take part in the household affairs. The climacteric, however, had not yet given any signs of its approach. The woman's facial expression and skin were surprisingly young-looking, though her hair had become gray.

In this case we find, first, a sensitive, refined, and puritanically educated girl, already prejudiced against a certain part of the marriage program by her mother's confession; secondly, her own acquired horror and repugnance toward it in an extreme degree; and, thirdly, the husband a coarse-grained, cynical, and even diseased man. Her long spells in bed were at first partly due to actual suffering from the disease contracted from the husband, but also subconsciously motivated by uncontrollable desire to escape from what

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in her condition and state of mind amounted to the licensed assaults of her husband.

At first thought one would have expected that when after some six years she was left free and safe by the desertion of her husband, she would then have got out of bed and taken some part in active life again. But here is where her subconscious came in. Her puritanical bringing up, her mother's experience, her own frightful experience of six years, and the dreary expectation that it would last until the climacteric and forty-five should release her, all these together had in six years time established so strong and deep a subconscious complex that it persisted long *after* the unexpected early and heavenly release came. The complex had already acquired a rate of negative momentum sufficient to carry it *at least* to forty-five, and this negative momentum could not be stopped merely by her waking consciousness realizing that further defense within the citadel of her bed was no longer necessary. Here again, as with Karoline Ollson, her wounded and outraged love nature had sought and found refuge in a Peter Pan complex, in a reversion to conditions corresponding to those of infancy for the entire active sexual period of her life. During these twenty-one years she had no more mental or emotional or physical stress. Her diet was simple and without meat. Consequently we find much the same physical results at forty-five in this case as in the other; namely, the facial appearance and skin of a

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young woman, although the hair had turned gray.

Why the climacteric did *not* come at forty-five, as previously self-determined both by tradition and, in this case, by strong subconscious desire, is an interesting point for further analysis. The explanation may appear far-fetched, but it seems to be as follows:

The momentum of the complex had been subconsciously timed for the forty-fifth year and could not have been stopped without the help of a psychoanalyst. As year after year passed without further stresses, the vivid memories of the bitter experiences began to fade. Having previously been a normal girl, and being still young, the natural but temporarily submerged joy of life and hope began to rise again. Though the first marriage had been a dismal failure, it was now a thing of the past. With the rising tide of the will to live and act and love again, came the subconscious desire to prolong the active sexual period of life. Hence while the momentum of the complex could not be destroyed, it was gradually withdrawn from one part of its original purpose—the climacteric at forty-five—and wholly expended in the other part—in maintaining the status quo in bed until the forty-fifth year.

Among the most significant symptoms of the menopause are the so-called hot flashes. Many women experience them, and they vary in time from a part of a minute to several hours. The analogy between hot flashes and blushing is obvious. Blushing arises from feelings of shame or embarrassment or self-conscious-

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ness. Every subconscious inferiority complex has feelings of shame or chagrin. So has the menopause inferiority complex. The difference between hot flashes and blushing is only one of degree. The causes of blushing are usually sudden and of short duration, and causes and effects are soon over. The causes of hot flashes are in the menopause itself, with its individual and racial complex of hopeless sexual inferiority, a thing of many years' growth in negative anticipation and fear. Causes are measured by their effects. A momentary cause of embarrassment gives a passing blush. A long anticipated menopause, with its assumed brand of inferiority and loss of sex attraction, manifests its fixed subconscious embarrassment in the more enduring and repeated blushes which we call hot flashes.

An Eastern writer says that long, long ago in ancient India women were very highly honored and revered. But in later centuries the male intellectuals lost sight of the greater spirituality of woman, and in consequence they and their states deteriorated. The same writer foresees a time not far off when the great problem of sex will be better understood, and when women will regain their true places in men's hearts and minds. And then, he says, a light will come into the world like the light that never shone on land or sea.

We live now in a changed world. Education, business, science, and art are free to women as to men. A woman's best time of rich usefulness and wider understanding is often only just beginning when her youth is

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passing. And in this knowledge woman's age-old dread and anticipation of premature sexual deterioration and inferiority is passing, and with it the objective effects. Thanks to beneficent science and social evolution, all intelligent women may now ignore the bog of premature change of life. In its present prevailing form it is largely an artificial epoch, a negative autosuggestion in the racial subconscious mind, which may be neutralized or even broken up by enlightened thinking.

Many women would even welcome a painless and premature menopause if they knew that while it brought sterility it would not mean loss of efficiency and sex attraction. And that is often what actually happens, if only more women—and more men—realized it. No less an authority than Forel assures us that the marriage relation is not only possible after the menopause but often desired by women. It is not to our credit that brilliant women of advancing age are far more appreciated in some of the European centers of culture than in America—something that Gertrude Atherton has called to our attention in her remarkable book, "Black Oxen."

Discriminating men, here as everywhere, now realize that our modern, experienced, efficient, well preserved women are more attractive at forty than others at twenty. Indeed to such men there is no comparison between the rich mental and emotional response of a mature woman and that of an inexperienced girl.

Treatment. The treatment—if it should be so

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called—of premature change of life is essentially the treatment for the prevention of middle age. But the specific sexual inferiority complex involved in the climacteric requires specific efforts to break it up. The physical treatment is fully covered in the later chapters, but it will be as well to summarize it here in one paragraph:

Physical. Keep up the body in good condition by wholesome simple food, almost whatever you like except meat, and not too much. Drink plenty of water but not ice-water. Attend religiously to daily elimination. Keep up the circulation by regular physical exercise. We are only as old as we look, and we depend physically on circulation. Put yourself in the hands of a wise physical trainer, preferably a woman, and get the *habit* of regular exercise until you love it.

Psychological. Remember the psychology of the subconscious. Every day repeat to yourself the arguments against the idea that the premature and painful menopause is a natural function. Convince yourself over and over again, not merely in your intellect but in your feelings. *Know* and *feel* that the ordinary menopause is a bugaboo, a delusion, a false autosuggestion of the subconscious mind. *Know* and *feel* that the natural cessation of menstruation should be a *gradual* process in the course of advancing age; or, if occurring earlier, a painless gradual fading away, without interfering with the health, the mind, the emotions, or the marriage relation.

CHAPTER X

HISTORICAL CASES OF GREAT LONGEVITY

A search through medical, legal, and historical records of modern times reveals an unexpected number of cases of great longevity and deferred middle age, cases that in many instances approximate to the biblical ages of some of the later patriarchs. As would naturally be expected, however, the very great ages assigned to some persons have been doubted by certain students of human longevity. One of the severest of such skeptics was W. J. Thoms. In his interesting book on "Human Longevity," published in 1873, he compiled a large amount of evidence, documentary and otherwise, in support of his skepticism, and maintained that there is no real evidence that any person ever exceeded the age of 106.

After careful and repeated reading of his evidence and arguments I am of the opinion that while some details in the very long lives of certain persons may be incorrect or exaggerated, and while the accepted birth dates are not often confirmed by definite, legal, documentary evidence, the traditional ages of these patriarchs are not materially disproved. About the

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most that Thoms is able to establish is that the original evidence often lacks additional corroborative evidence. Another point psychologically worth noting is that Thoms frankly admitted that he was skeptical before he undertook any investigations. Such an attitude would of course give him a subconscious bias toward finding just what he wanted, and an equal subconscious bias toward ignoring data that might strengthen the other view. All of us behave more or less in that way.

It is significant that so careful and painstaking an investigator as Arnold Lorand apparently accepts many of these great ages as authentic, and cites them as evidence in his books without comment. Bennett, however, rejected them in toto, but based his opinion entirely on Thoms's negations. He also accepted Thoms's absurd dictum that the extreme human age limit is 106 years. In doing so he was a forceful example of those who consciously and subconsciously set their own age limits. Although he laughed at the respectable Bible age limit of three score and ten, he merely moved his pegs thirty points further along and then said, "I confidently expect to verify the truth of the statement of Jesus, the son of Sirach, 'The number of a man's days are at most an hundred years.'" It would be interesting to know why Jesus, the son of Sirach, should be considered authority on this point! Bennett's next remarks are psychologically very interesting and instructive:

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And why, if the process of repair and elimination can be kept upon an equilibrium, is it not possible to live to double that age? My answer is wholly illogical and without explanation. Because there seems to be an occult law preventing such extraordinary longevity of human life. There is no authentic record that it has ever occurred, and it does not seem that it can be. In the economy of the universe certain limitations of our knowledge and possibilities of life seem to be fixed, and beyond that limit we cannot pass.

Those words show how completely—and illogically, he admitted—he had already fixed his own age limit by another Bible figure and the arbitrary conclusions of Thoms, had not an “untimely” death intervened. It would be hard to find in psychologic literature a more marked example of mental subservience to the opinions of others—and from an educated and intelligent man who had already smashed one Bible mile-stone.

In sum, it seems to me that the long-accepted ages of Parr, Jenkins, and the others I refer to in this chapter are about as well authenticated as most historical and biographical data coming down from periods when written records were poorly kept or not at all. Therefore in the absence of definite proof to the contrary, which at this distance in time can probably never be had, I conditionally accept the great ages of these persons on the written records of their time and the monumental inscriptions in their memory.

Thomas Parr. This man was born at Winnington,

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Shropshire, in 1483, and died in London on November 15, 1635, having lived 152 years and through the reigns of ten kings. When seventeen he went out into service. When thirty-five he returned home on account of the death of his father. He remained a bachelor until eighty years old, and then married his first wife, by whom he had two children who died in infancy. When 105 he was unfaithful to his marriage vows and became the father of an illegitimate child by a woman named Katherine Milton. For this offense he was required by the custom of his community to do penance by standing in a white sheet publicly in Alderbury Church. His first wife died when he was 112. Ten years later, when 122, he remarried, his second wife being a widow. When 130 he was still a strong vigorous man and sexually potent, as his second wife declared to Dr. Harvey. He then worked daily in the fields and even thrashed corn. When about 133 he became blind, and thereafter had to give up his outdoor life of vigorous wholesome work and sit idly in his house. His memory failed steadily after his blindness came upon him. But his wife said that his sexual power did not begin to diminish until he was more than 140.

Parr took three successive leases to his home, and when he was one hundred his landlord—the grandson of his first landlord—gave him a lease for the rest of his life—which lease he held for fifty-two more years.

When 152 the fame of Parr's great age reached the

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ears of the Earl of Arundel and Surrey, who came personally to see if so improbable a story were true. When the earl had satisfied himself on his point he induced Parr to go with him to London, that the king and court might see so wonderful a man. Parr was taken to London in a litter and was accompanied by his daughter-in-law Lucy. During the latter part of September he was taken before the king, who said to him, "You have lived longer than other men; what have you done more than other men?"

And Parr promptly replied, "I did penance when 105 years old," that event seeming to have been the most vivid and cherished in his impaired memory. He remained in London until the day of his death, which occurred less than two months after his arrival.

By order of the king an autopsy was made the day after death by Sir William Harvey, the famous physician and discoverer of the circulation of the blood. The body and all its organs were as those of a mature man in the prime of life. The hair on the body and legs was black. The costal cartilages (of the ribs) were soft and flexible, and the testes were large and sound.

Parr's diet during all his long life prior to coming to London had been very simple—mostly coarse bread, subrancid cheese, and milk. Dr. Harvey ascribed the cause of his untimely death to the change from the simple wholesome food of the country to the varied and rich diet and wines he had lived on since coming to

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the city; also to the smoky and unwholesome air of London after a life spent in a pure atmosphere. Dr. Harvey further wrote that as all of the organs were in such sound condition Parr would probably have lived some time longer if he had remained in the country.

The inscription over Parr's burial place in Westminster Abbey is as follows:

Tho: Parr ye County of Sallop Born in Ae 1483. He lived in ye reignes of Ten Princes viz: K.ED.5. K.Rich.3. K.Hen.7. K.Hen.8. K.Edw.6. Q.Ma. Q. Eliz. K.Ja. & K.Charles Aged 152 yeares, & was Buried Here Novemb. 15, 1635.¹

John Newell. 127 years. All the information I have about him is a foot-note in Thom's book as follows: "Harl. Mis. (ed. 1811) Vol. vii, p. 69. The Annual Reg., Vol. iv, p. 144, contains the following statement: 'July, 1761. Died lately, John Newell, Esq., at Michalstown, Ireland, age 127, grandson of Old Parr, who died at the age of 152.'" Thoms insists that Parr had no descendants because his two children by his first wife died in infancy, and there is no

¹ *References:* John Taylor, "The Old, Old, Very Old Man," 1635 (a metrical history). Sir William Harvey, "Works of Wm. Harvey, M.D." (autopsy of Parr, and Transactions of Royal Society). Harrison, a painter of Norfolk, manuscript, said to have been in hands of the Rev. Francis Burton of Cambridge. W. J. Thoms, "Human Longevity," 1873. Arnold Lorand, "Old Age Deferred."

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known record of children by his second wife. But in Taylor's metrical account of Parr's journey to London there is definite mention of his daughter-in-law Lucy, which would seem to imply a son by his second wife. In the absence of such records there remains also the inference that John Newell may have been descended from Parr's illegitimate child by Katherine Milton, born in 1588, when Parr was 105 and did penance because of that child. Mention has also been made of other descendants of Parr, several who lived to be considerably over the century mark, and one who died at the age of 124, but I have no other information available about any of these.

Henry Jenkins. This man is believed to have reached the great age of 169 years, being born about the year 1501, and dying in December, 1670. The most of his life was passed at Ellerton-upon-Swale, Yorkshire. One of his earliest recollections was that when twelve years old he was sent with a horse-load of arrows to the rear of the battle of Flodden Field, which was fought on September 9, 1513. He grew up illiterate but correctly remembered many other details of that time; for example, that the name of the general in command was the Earl of Surrey, and that King Henry VIII was then in France. In the reign of Charles II he was the only living man who remembered the dissolution of the monasteries, an event which made considerable stir in its time. There were four or five

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old men in the parish aged one hundred or thereabouts who said that Jenkins was an old man as far back as they could remember.

On April 15, 1667, at Catterick, Jenkins was a witness in the case of Anthony *vs.* Smithson, as to events which occurred more than three score years previously, and his evidence decided the case in favor of Anthony. Moreover Jenkins was also a witness at York in the case of Howe *vs.* Wastell, and testified as to events 120 years before.

Clarkson, in his "History and Antiquities of Richmond," gives a most astounding description of the visit of the agent of Mrs. Wastell to Jenkins to find out what account he could give of the matter in dispute.

He saw an old man sitting at the door, to whom he told his business. The old man said he could remember nothing about it, but that he would find his father in the house, who perhaps could satisfy him. When he went in he saw another old man sitting over the fire, bowed down with years, to whom he repeated his former questions. With some difficulty he made him understand what he said, and after a little time got the following answer, which surprised him very much: That he knew nothing about it, but that if he would go into the yard, he would meet with his father, who, perhaps, could tell him. The agent upon this thought that he had met with a race of antediluvians. However, into the yard he went, and to his no small astonishment found a venerable old man, with a long beard and a broad leathern belt about

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him, chopping sticks. To this man he again told his business, and received such information as in the end recovered the royalty in dispute.

In the "Philosophical Transactions of the Royal Society" for 1696, Dr Tancred Robinson quotes Ann Savile's famous account of her interview with Jenkins, and says, "He hath sworn in Chancery and other courts to above 140 years memory, and was often at the Assizes at York, whither he generally went a-foot." Dr. Robinson's most significant item from our standpoint, however, is that "his habitual diet was course and sower."

In Bolton Churchyard there is an obelisk erected to the memory of Jenkins, on which is recorded the following inscription:

Blush not marble to rescue from oblivion the memory of Henry Jenkins, a person obscure in life, but of a life truly memorable; for he was enriched with goods of nature, if not of fortune; and happy in the duration, if not variety of his enjoyments; and tho' the partial world despised and disregarded his lone and humble state, the equal eye of Providence beheld and blessed it, with a patriarch's health, and length of days, to teach mistaken man, these blessings are entailed on temperance, a life of labour, and a mind at ease. He lived to the amazing age of 169. Was interred here december 6th, and had this justice done to his memory. 1743.²

² *References:* W. J. Thoms, "Human Longevity," 1873. The Rev. Canon Raine, Yorkshire Archæological and Topographical,

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Robert Bouman. 118 years. Born at Hayton in 1705. Died June 18, 1823. This man spent almost his entire lifetime in the neighborhood of his birthplace. He had a distinct recollection of an incident of the Jacobite rebellion in 1715, when he was ten years old. It is alleged by Thoms that the Bouman who died in 1823 was really the son of the one born in 1705. Unique and interesting as this theory may be, there is to offset it a stained-glass window in Itherington Church to the memory of Bouman—or Bowman—by *his youngest son*, with this inscription:

Robert Bowman, Yeoman of Itherington, died 18th. June, 1823, at the patriarchal age of 119 years.

The window is also inscribed with the names, ages, and dates of deaths of Robert Bowman's wife and five sons.

Ninon de Lenclos. Born May 15, 1616; died October 7, 1706. The story of this remarkable woman gives the most instructive example on record of retained

Society, Vol. i, p. 129 (Jenkins's evidence in court when 157). Dr. Tancred Robinson, "Philosophical Transactions of the Royal Society," Vol. xix, 1696, with reprint of Ann Savile's account of interview with Jenkins. Clarkson, "History and Antiquities of Richmond" (visit of Mrs. Wastell's agent to Jenkins). Richmond Bell, "Evidences of the Great Age of Henry Jenkins . . . 1859." Whitaker, "Richmondshire," Vol. ii, 1823 (the memory of Jenkins).

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youthful appearance of face, skin, and figure. During her youth—youth, that is to say, as ordinarily counted by the measure of years—she led the free life of a typical Frenchwoman of the gayest and most unconventional society of the seventeenth century. Later she became the acknowledged leader of society and fashion in Paris. Along with a striking type of beauty she had a high intellectuality and radiated an irresistible personal magnetism and fascination, for women as well as for men. Among her intimate friends were Queen Christina of Sweden and powerful persons among the French nobility, as well as many of the most noted literary men of her time, such as Voltaire, Molière, and Saint-Evremond.

The well known portrait of Mme. Lenclos by André Beauchamps in 1686, reproduced in Sanford Bennett's book, "Old Age: Its Cause and Prevention," shows her at seventy with the appearance of a mature woman in her best period. It is noteworthy that her skin was then free from wrinkles, and her shoulders, bust, and tower-like neck were of exceptional roundness and beauty. So beautiful was she at ninety that a young man who knew her age fell desperately in love with her. Her figure retained to the last the perfect contours and elasticity of a woman in her prime.

The secret of her perennial youth is no mystery and is revealed in an old pamphlet left by Jeanne Sauval,

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who was her personal attendant or maid for nearly fifty years. It consisted mainly in a system of physical exercises which she had thought out for herself, because almost nothing was known about scientific physical culture in her time. Daily and persistently she practised exercises which preserved the tone of all the muscles of her body, and more especially those of the face, neck, and throat. She also made great use of friction of the skin, and sometimes wore a metal mask when she slept. A careful study of her system of physical exercises was made by Sanford Bennett and incorporated in his valuable book to which I have referred.

An interesting and suggestive comment made by Bennett is that Ninon's most intimate and lifelong friend and former lover, Saint-Evremond, probably learned from her some of the secrets for prolonging youth, for he, at the age of eighty-five, inspired a romantic sentiment in the heart of one of the famous beauties of the court of Charles II.

No information is at present available to me as to the cause of Ninon's death. In view, however, of the authentic facts (1) that at ninety not only was the skin of her face and neck of smooth and youthful appearance, but (2) that her figure also retained the proportions of a beautiful woman in her mature youth, the thought suggests itself that she might have preserved her perfect body and bewildering beauty for many more

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years if her wonderful life had not been prematurely ended.³

The Countess of Desmond. Born 1464. Died 1604. Age 140 years. The identity of this famous woman has been a matter of some dispute among students of longevity, and Horace Walpole appears to have confused her with another old Countess of Desmond who survived her by twenty-two years. The following reference to her in Smith's "Natural and Civil History of the County and City of Corke," published in 1750, seems to settle definitely who she was :

1534. Thomas, the 13th. Earl of Desmond, brother to Maurice the 11th. Earl, died this year, at Rath Keale, in the County of Limerick, being of a very great age, and was buried at Youghal . . . The Earle's second wife was Catherine Fitzgerald, daughter of the Fitzgeralds of the House of Drumana in the County of Waterford. This Catherine was the Countess that lived so long, of whom Sir Walter Raleigh makes mention in his "History of the World," and was reported to have lived to 140 years of age.

Raleigh, in his aforesaid history, says of her :

I myself knew the Old Countess of Desmond of Inchiquin in Munster, who lived in the year 1589 and many

³ *References:* "The Real Ninon de Lenclos," by Helen K. Hayes. "Ninon de Lenclos and Her Century," by Mary C. Rowsell. Sainte-Beauve's "Saint-Evremond and Ninon." Sanford Bennett's "Old Age."

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years since; who was married in Edward IV's time, and held her jointure from all the Earles of Desmond since then; and that this is true all the noblemen and gentlemen of Munster can witnesse.

Moore refers to the countess as the "Frisky old Girl." In Moryson's "Itinerary," published in 1617, occurs the following significant reference to the countess:

In our time the Irish Countess of Desmond lived to the age of 140 yeares, being able to goe on foote foure or five miles to the market towne, and using weekly to do in her last yeeres: and not many yeeres before she died she had all her teeth renewed.

The well known portrait of the countess at Muckross bears the following inscription:

Catherine, Countess of Desmonde, as she appeared at ye Court of Our Sovereigne Lord King James in thys present yeare A. D. 1604, and in the 140th. yeare of her age. Thither she came from Bristol to seek Releefe ye House of Desmonde having been ruined by Attainder. She was married in ye yeare of King Edward IV. and in ye course of her long Pilgrimage renewed her teeth twice. Her principale Residence is Inchiquin in Munster, whither she undauntedly proposeth (her Purpose accomplished) incontinentlie to return. *Laus Deo.*"

Thoms tried hard to account for the accepted 140 years of the countess on the theory that the lives of three countesses were strung together, aggregating 140

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years. This theory is interesting, but I do not find the evidence for it convincing enough to offset the historical or traditional age of a person in her prominent social position.

A very significant testimony as to the long-retained youth of the countess is that her marriage to Earl Thomas could not have taken place before 1529, Nichols having shown that his first wife Shela was living in 1528. Catherine must therefore have been about sixty-five years old, and he was also already a very old man. Consequently this must have been *her* second marriage also, and obviously it was not the marriage in the reign of Edward IV, mentioned by Raleigh, for Edward died in 1483. She is said to have become the mother of a daughter soon after her marriage to Earl Thomas, and this has been triumphantly cited by skeptics as proof positive that she could not possibly have been then sixty-five years old or anywhere near that age.

Reasonable as that assumption may be as a *general* rule for women, it seems to me to be about as inconsistent in the opposite direction as according without question the paternity of the child to Earl Thomas, then a very old, senile man. As to the exceptional possibility of motherhood after sixty-five, however, the two immediately following cases, one cited by Lorand, the other in the recent press, will speak for themselves.⁴

⁴ *References:* Horace Walpole, "Historic Doubts." Sir Walter

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Menstruation at Sixty-nine. Lorand tells of a case personally known to him, an Italian lady of sixty-nine, who is still attractive and good looking and appears about forty-five. She has had twelve children and *still menstruates*. "There is more fire in the eyes of this Italian matron than in many women of half her age." Having not yet reached the climacteric it must be assumed that she is still capable of bearing children and is therefore a potential mother at the age of sixty-nine.

Motherhood at Sixty-eight. The following case has recently been widely discussed in the press of the United States:

In Valladolid, Spain, lives Mrs. Pedro Lorenzo, who is remarkable. She is 68 years old. She has just become the mother of a baby, which happens to be her twenty-ninth baby. All of her children have been boys. That also is remarkable. Mrs. Lorenzo must be proud of her accomplishment, even though many of her sons are dead. But not more proud than many an American mother with just one son or daughter to rear with intelligent care. It really is more important to rear one child in this way than to rear many children in other ways.

Raleigh, "History of the World." John Gough Nichols, essays in Dublin Review, Vol. li. Smith, "Natural and Civil History of the County and City of Corke," published in 1750. Fynes Moryson, "Itinerary," published in 1617. W. J. Thoms, "Human Longevity," published in 1873.

CHAPTER XI

MORE HISTORICAL CASES

Examples are more convincing than the most plausible theories and deductions. We may theorize as much as we like about the causes of aging and its prevention, but one genuine example of long retained youth has far more weight than a shelf full of books or innumerable opinions; it speaks not only for itself but for countless others potentially in the making. Cases such as those of Thomas Parr and Ninon de Lenclos, described in the last chapter, are very impressive. So also is that of Sanford Bennett, referred to in the first chapter, which has the added advantage and force of being nearly contemporary with the present writing, and therefore unassailable by skepticism. Believing as I do in the high teaching value of many examples of far prolonged youth, I shall devote another chapter to such cases. The first nine are summarized from many cited by Lorand, and as he gives them without comment on the evidence on which they rest, it is assumed that he accepts them as authentic; those that are still to follow Lorand's are derived from other sources.

Petraz Czarten, a Hungarian, died in the village of Kopros in the year 1724, aged 185 years.

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Joseph Surrington died in 1797 near Bergen, at the age of 160. He had been married several times, and when he died left a son 102, a young widow, and a son *nine* years old.

Dr. Politiman, a surgeon of Lotharingia, lived to be 140. Opponents of the Eighteenth Amendment will be glad to know that he had drunk heavily every night since he was twenty-five years old.

Drakenberg, a Dane, also a heavy drinker, lived to the age of 146. When 111 he married for the second or third time. When 130—after his wife's death, he it said to the credit of his virtue—he made violent love to a young peasant girl, who, however, refused to marry him.

John Bayley, of Northampton, England, died at the age of 130. It is significant that when his body was autopsied the testes were found to be large in size.

Peter Albrecht lived to the age of 123. He married when eighty-five and had seven children.

Gurgen Douglas, of Marstrand, near Gothenburg, Sweden, lived to the age of 120 years and seven months. He married when eighty-five and had eight children, the last one born when he was 103.

R. Glen lived at Philadelphia, and died at the age of 114 years. It was said that he was never known to have missed a church service in his long lifetime—a fact to which pious people may point as a reason for his longevity. He had been married three times.

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His third wife was only thirty when he died, and she affirmed that his virility was not impaired.

Baron Baravicino Capellis died at Meran, Italy (then Austria), in 1770, at the age of 107. He had been married four times. He was first married when fourteen years old, and his last marriage took place when he was eighty-four. He had seven children by his four wives. Moreover his last wife was pregnant when he died.

A Russian 138. The Associated Press of February 4, 1926, carried the following item:

Ivan Tretya, reputed to be the oldest peasant in Russia, died near Rostov to-day at the age of 138. Ivan was married three times, taking his third wife in his one hundredth year. He has fourteen children, the eldest of whom, a daughter, now is 101. He never left the soil, never was ill, and retained his hair and teeth to the end. He claimed to have fought in every war in which Russia engaged for the last 118 years.

A Long-Lived Turk. This case was reported widely in the press two or three years ago, and was that of a seemingly middle-aged Turk who was said to have produced documentary evidence that appeared to indicate that he was 140 years old.

The ninth edition of the "Encyclopædia Britannica" mentions four other cases of alleged great longevity which were not there considered as well authenticated.

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With due allowance for exaggeration, however, all of them must have gone far over one hundred years, and as such they are very well worth mentioning again here. They are as follows: Margaret Patten, 137; Thomas Damme, 154; John Rovin, 172; Peter Torten, 185.

Soloman Trismosinus. According to Van Helmont's account,¹ quoted by Hartman, this alchemist and physician of the sixteenth century must have prolonged his life far beyond 150 years. It is narrated that met the famous physician and philosopher Paracelsus in Constantinople in 1521, and that very long afterward he was seen and identified by a French traveler toward the close of the seventeenth century.

A Deathless Hindu. Mme. H. P. Blavatsky, author of "Isis Unveiled," "The Secret Doctrine," and other works, writes that she first met her guru (Hindu teacher) in London in 1851. She saw him a number of times afterward until shortly before her death in 1891. He visited Colonel H. S. Olcott in New York about 1880 and was seen by a number of people in India a year or two later. The last record of him was in 1907, when he came to the bedside of Olcott, who was then dying. All those who saw the Hindu at various times had seen his picture in the possession of Mme. Blavatsky. At his last appearance at the deathbed of Olcott he still looked like a very tall, erect, powerful man of about forty-five—exactly the same as when seen in London fifty-seven years before. All the

¹ "Tartari Historia."

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incidents mentioned in this case are on record in the annals of the Theosophical Society.

The next two cases, like Bennett's, have the advantage of occurring in our own time, and both the subjects are still living. Their further history will be followed with intense interest by all who are seriously engaged in this study.

Dr. Adolph Lorenz. While many doctors who have studied the subject of rejuvenation have acquired such confidence in certain surgical procedures that they have tested them in their own bodies, few have had the courage publicly to acknowledge having done so. It is therefore a matter of particular satisfaction to us to have the frank testimony of an eminent and internationally known surgeon as to the results of one of these operations on himself.

Most of us who are now middle-aged—as reckoned by years—will remember the great newspaper notoriety gained in the United States by an Austrian surgeon, Dr. Adolph Lorenz, in the treatment of certain deformities. So great was his previous fame in Europe that he was engaged by J. Ogden Armour of Chicago to operate on his daughter Lolita. That was twenty-four years ago, when Dr. Lorenz was forty-eight years old.

Dr. Lorenz made two subsequent trips to the United States, and it was then noticeable, especially during the last one—about five years ago—that he was failing in strength and vitality; in short, that he was an aging man.

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The following year Dr. Lorenz returned to the United States. Those who had seen him during his previous visits were surprised and puzzled at the change in his appearance and strength. Before, an aging and tired man, now he appeared full of vim and vitality. His form had straightened up, his walk was brisk, his eyes full of fire. In sum, he now looked almost as strong and vital and dominating as he had twenty-four years before.

Naturally this remarkable change in his appearance aroused interest and wonder. No public announcement had as yet been made as to the cause for his recurrence of vitality. But the famous doctor himself now frankly tells the American public the story of his restoration to active life in the world.

The magazine "Liberty" for March 13, 1926, has an impressive article by Judge John de B. Limley, entitled, "Science Can Make You Grow Younger." The article consists in part of an interview with Dr. Lorenz in which he gives full information as to what he believes to be the cause of his rejuvenation. It is due entirely, he asserts, to what is known as the Steinach operation, a simple and safe operation—*when* done by a surgeon experienced in the operation and confident of its efficacy—and consists in turning the direction of the fluids of one or both sex glands *inward* instead of outward. Dr. Lorenz's own remarks are the most definite yet made aside from those of the operators themselves, and I shall now quote them, in part:

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When I was sixty-seven years on earth I was done—a broken old man. I underwent the Steinach operation for rejuvenating the aged. Five months later I was back in the United States, strong as I was at forty. Now, five years after the operation, I am well, healthy; able to do my work and expecting to do it for years to come. I would not be here now, in the United States and at work, even if I were alive, but for that operation. That is my conclusion.

Could anything be more definite than this, backed up as it is by the testimony of men who saw him twenty-four years ago, and later when he was obviously an aging man? Dr. Lorenz advises every man over sixty, and every man who is experiencing the first symptoms of arteriosclerosis (hardening of the arteries), to have the Steinach operation performed. He says further of himself that he had felt his work was finished, and that all who knew him had given him up. He realized that he had nothing to lose and no risk whatever to take by trying the operation. He longed to feel *alive* again. And “so I went to Dr. Victor Blum of Vienna and got back my vigor and health. For five years I have felt—oh, how is it that you say it?—great—strong!”

He warns, however, that the operation shall not be performed until after sixty, unless there is premature senility. He scores the prudery and false modesty that make secrets of such operations, about works of science. The son of Dr. Lorenz says of the father,

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"At seventy-two he is able to wear out the majority of men of fifty in a day."

It is regrettable, however, that Dr. Lorenz does not believe that women can be rejuvenated by an analogous operation. But he leaves them a loophole for hope when he says, "The operation, simple and harmless for the male, would be difficult and dangerous for women."

Obviously the operation for obliterating the ducts of the ovaries would be more difficult because it would necessitate opening the abdomen. But when performed by a good surgeon it would be no more dangerous than an ordinary operation for appendicitis. The principle involved is the Steinach principle, turning the secretions of one or both sex glands inward instead of outward. It seems to be entirely consistent to expect corresponding rejuvenating results in aging women.

Summary. Dr. Lorenz's case and his opinion, as well as that of Dr. Harry Benjamin of New York, seem to establish it that the Steinach operation is pre-eminently one for the rejuvenation of the aged rather than the middle-aged. And yet that should not be considered as settled yet. There is one way in which it could be settled in due time, by performing the operation on mature criminals serving long or life sentences, who could be constantly under scientific observation for an indefinite period. As to women, many have had their tubes obliterated and removed by surgeons in consequence of severe tubal infection and cancer of the uterus, the ovaries having been left in place. Such

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women have had what virtually corresponds to the Steinach operation. Their cases should be followed as closely as possible to determine whether they retain their youthful appearance longer than other women.

Even in this spectacular case, however, there appears to be room for a psychological element which should not be ignored. I am informed that previous to the Steinach operation, and immediately after the disastrous ending of the World War for Austria, Lorenz suffered severely from financial anxiety. That condition was bounteously relieved by his subsequent professional success in America. It is psychologically possible therefore that some part of the great improvement following the Steinach operation may have been due to relief from worry and the all-around feeling of optimism incident to a bettered financial condition, together with scientific faith in the results of the operation.

After having discussed Dr. Lorenz's conditional opinion that women cannot be rejuvenated as men can be by surgical operations, it is gratifying to follow the account of his own most interesting case with that of a woman of sixty-nine who was rejuvenated some years ago and now has the appearance and vitality of a young girl. She has not yet told of the method which restored her youth and beauty, and we have no idea whether it was surgical, medical, or otherwise. Whatever it was, however, it demonstrates—unless the whole case is a deliberate and large-scale fraud—that nature does not discriminate against women as to the pos-

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sibilities of rejuvenation. More than that, this woman seems to have done better than Dr. Lorenz. He, at seventy-two, has regained strength and vitality, but still looks old—or at least elderly. She, at sixty-nine, has not only exceptional strength and vitality but looks young and beautiful.

Fannie Ward. I have no authoritative information about this case—"authoritative" usually connoting statements by medical men or women on questions of anatomy, physiology, or rejuvenation. Neither have I had an opportunity to verify the record of her birth. Yet her case has for some time received much notoriety in newspapers and magazines, and it is a pretty safe rule that so much smoke means at least *some* fire.

Fannie Ward is stated to be now sixty-nine years old. In her youth and mature womanhood I believe she was an actress. "Moving Picture" for March, 1926, has a very interesting article about her, written in the characteristic breezy style of that optimistic magazine, which strongly suggests that Miss Ward, like Ninon de Lenclos, has learned the secrets which can stand off middle age—not to mention old age—and maintain indefinitely the physical appearance and strength and vitality and magnetism of youthful maturity.

To summarize the article, it is stated that Miss Ward is not only approaching the biblical knock-out age of seventy but that she is also a grandmother. She makes the claim that any woman can do as she has done. It

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is said that she "is youth itself" and that she has unlimited vitality. Her animation is like that of a flapper of seventeen. Her face is free from lines and wrinkles. "Even the closest inspection can reveal no deficiencies." Her eyes sparkle like the care-free eyes of early youth. "Her cheeks are firm and rounded." She is said to be "the leading spirit in the gayest life in New York and Paris."

It is stated that Fannie Ward's present appearance of strong and magnetic youth is not a preservation but a comparatively recent attainment. The article goes on to say that not very many years ago "she was grown old both in face and mind." It seems that she had a severe nervous breakdown, and in consequence of it she happened to consult a doctor, who, if he did not actually teach her how to regain her lost youth, gave her a clue which enabled her to discover the great secret. Unlike most people of advanced age, her brain seems still to have been plastic enough to consider new ideas and to disregard the "authoritative" conventional opinions of "everybody," including doctors. Instead of sighing and saying, "That is contrary to the Bible, and therefore impossible," or, "At my time of life it couldn't be done," she seems to have taken the position: "I'm not getting anywhere as it is; in fact I'm going fast, and I'll soon be gone. You are a doctor, and you ought to know more about this sort of thing than I. I've nothing to lose and everything to gain. I'll see it through!"

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Allowing for some exaggeration in newspapers and magazines, it seems self-evident that Miss Ward has succeeded by some means not yet revealed in regaining at least a considerable part of her long-lost youthful looks and strength; enough certainly to be talked about and written about and syndicated in every city and town from Paris to San Francisco. Of course we do not forget that women of the stage become adepts in cosmetic devices for camouflaging the looks of middle age, and even those of old age, into semblances of youth which can to a greater or lesser extent deceive even men who pride themselves on their infallible judgment of women.

The two pictures of Miss Ward in the "Moving Picture" article are those of a woman of twenty to twenty-five, and if the case rested on those alone there would always remain the suspicion that the look of early youth was due to an expert photographer's art. But such galvanizations cannot deceive *women*, and especially women of the histrionic profession.

The latter part of the article consists of a series of brief discussions of the case by fifteen of the most popular present-year movie queens. The personal testimony of the first on the list is very definite and direct, and all the more convincing because it admits exaggeration by the magazine in its statement as to the extreme youthfulness of her appearance. Here are the words of the famous screen star exactly as printed:

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I met Fannie Ward abroad, and my husband and I both thought her marvelous. She doesn't look seventeen, of course, but she looks delightfully young, and she must feel young, for she acts it. She can dance all night and go all day and still look lovely. I *can't*. Bert and I decided that it must be something inside her—nothing that she has done to her could give her such pep and vim—it must be of the spirit. I don't believe that woman will ever grow old or die.

That is our adorable Clair Windsor's impression of Fannie Ward. Yes, right here I can mind-read the contemptuous learned comment of "authority" on her testimony: "Incompetent! She is neither a doctor nor a physiologist." Perhaps not. But she is a young and beautiful actress, and therefore an *authority* in matters of cosmetics and personal camouflage, which after all is the burning question in this case. Assuming that Miss Ward's stated age of sixty-nine is authentic, it is then entirely a question of whether or no her present appearance of youth is fact or art, surface or depth. Mrs. Lytell says that it is *fact*, something inside her; a most unique and incisive way of saying that her youth and beauty are more than skin-deep.

Assuming that Mrs. Lytell has truthfully stated her impressions of Fannie Ward—and we can see no reason to doubt her word—her statement has the weight of *expert* testimony in a matter in which her opinions are authoritative in every sense of what we conceive to be

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authority; namely, exceptional experience in all that appertains to the arts which contribute to the enhancement, preservation, and counterfeiting of physical youth and beauty.

So much for the expert testimony of an expert woman. Now for a man's testimony. In the April number of the same magazine a number of male screen stars give their opinions on Fannie Ward and the desirability of prolonging the appearance and attributes of youth far into the years which have until now put the blight of old age on the vast human majority. Their eighteen expressions of opinion contain about an even division of up-to-date ideas and echoes of antiquated conventional attitudes, but with that we are not concerned at present. What we *are* interested in is the testimony of William Collier, Jr., which I quote:

I know Fannie Ward very well and I think she's marvelous. If all women could imitate her, I'd say: "Good work—go ahead!" But all women can't. Fannie Ward is full of pep all the time. It's not put on. In Paris, she's invited everywhere because her hostess can depend on her being the life of the party and any affair with her as a guest is bound for success. I know some girls who aren't over twenty-three who might as well be sixty for all the fun they get out of life. It doesn't help them to look young—their minds are already old. Being sixty, looking twenty and feeling eighty don't go together. But looking and feeling young make age unimportant. Of

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course, there's nothing worse than a kittenish old woman, but youth—if it's sincere—is great!

Here then are a man's impressions of Fanny Ward; a man in her own profession, expert in the arts and tricks that simulate youth and beauty. Perhaps just because he is a man it might be assumed that Fannie Ward could pull the wool over his eyes as to her *apparent* beauty. But not so as to her exuberant and continuous vitality. *That* could not be simulated as is the temporary friskiness and robustness said to be imparted to an old horse for quick trading purposes by means of ginger and of air blown into hollows over shrunk muscles.

Ray Griffith's contribution is short but to the point:

If women can get away with it, eternal youth is great stuff. I don't see any good reason for anyone's settling down to old age while there's a chance to dodge it. There are very few Fannie Wards who make a success of it; the majority are rather pitiful because they're wasting time when they might be living.

The implied assertion by the magazine that Fanny Ward looks only seventeen is of course an exaggeration. The psychology of the statement is apparent in the title of the article, "Would You Want To Be 17 at 70?" Now seventeen and seventy alliterate beautifully; much better than, say, twenty-seven and seventy. Hence a neat bit of journalistic strategy that we can

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admire but have to take into account. Mrs. Lytell pleasantly squared up this difference when she said, "She doesn't look seventeen of course, but she looks delightfully young." Those words seem to clench the evidence and to establish that Fannie Ward, though not looking seventeen, has, at seventy, actually retained or acquired the appearance and vitality of a young woman.

Until there is further evidence to the contrary then, common sense tells us to recognize in Fannie Ward a case of rejuvenation in the literal sense of the word; a real-life embodiment of Gertrude Atherton's appealing heroine Mary Ogden and a standing refutation of a recent "authoritative" statement that the rejuvenated heroine of "Black Oxen" is as much a misrepresentation of physiological possibilities as Clark Russell's "Frozen Pirate"; a present-day example of the famous Ninon de Lenclos, who died at the patriarchal age of ninety, in the full glory of mature beauty and vitality.

The number of examples given in Chapters I, X, and XI, certainly demonstrate that *some* men and women have succeeded in deferring middle age to what seems to us incredible years when contrasted with ordinary experience. Until comparatively recently we could only conjecture as to the causes for such sustained youthful appearance and such extraordinary longevity. Now, however, what many have done before, more should be able to do again and even to surpass, because much exact scientific knowledge is now available which was entirely unknown before.

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I shall close this chapter with one more example of long unchanging youth, an altogether exceptional one and quite in a class by itself, a man who was widely known in Europe in the latter part of the eighteenth century for about forty years.

The Comte de Saint-Germain. So far as I know, the story of this remarkable man of the eighteenth century has never before been seriously considered among the conspicuous examples of abnormal human longevity and long retention of the strength and appearance of mature manhood. Probably the omission is due to the shady reputation given to him by writers of the type who regard every person a charlatan who can do things that are in advance of his time and beyond the comprehension of his critics.

On looking into many references to Saint-Germain, taken from various records and manuscripts of the eighteenth and nineteenth centuries, I am convinced that he is a striking example of just that part of the subject of this book that it is desired to stress most of all: the retention of the appearance of virile youth far beyond what is now the average period of middle age with its attendant signs of coming senility. One fact alone about him proves this. He was publicly known in many European capitals for some forty years, from about 1740 to 1783, and during that entire time his appearance did not perceptibly change from that of a man in the prime of magnificent manhood, between thirty-five and forty.

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So much for what is publicly and indisputably on record. But that is not all. There is no authentic record of his death except a statement attributed to his friend, the Prince of Hesse-Cassel, that he died at Eckernförde in 1783 while making chemical experiments.

Against this there is, first, the statement in Gräfer's "Memoirs" that Saint-Germain was in Vienna about 1789, "where we had the never-to-be-forgotten honor of meeting him." Secondly, there is the manuscript left by his friend the Comtesse d'Adhémar, in which she positively declares that she saw Saint-Germain several times after his supposed death; namely, at the execution of the queen on October 16, 1793; on November 9, 1799; on the day after the death of the Duc d'Enghien in 1804; in January, 1813; and, lastly, on the eve of the murder of the Duc de Berri, in February, 1820.

Accepting Mme. d'Adhémar's statement as respectable and reasonably credible testimony that would have been accepted without question on any other point, we must add another forty years to the known existence of Saint-Germain, with the same marvelous retention of the appearance of mature youth.

Up to this point then we have a record of eighty known years for the Comte de Saint-Germain, in a changeless prime of manhood. Add to that perfectly obvious forty years to account for his mature appearance about 1740 when he first appeared under the name

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of Saint-Germain, and we get a total of about 120 years—and still at his best when last seen in 1820 by the Comtesse d'Adhémar!

But it would seem that there is still more to add to the story of this mysterious life. Mrs. Cooper-Oakley, after probably the most exhaustive researches yet undertaken into the mystery of the Comte de Saint-Germain, believes she can definitely identify him with the personalities of seven other prominent characters in Europe extending as far back as 1710. If her deductions are correct, it would then be obviously necessary to add still another thirty years for his growth to mature manhood prior to 1710, bringing his age to approximately 150 years.

I pass over without serious comment the oft-repeated statement that Saint-Germain was an adventurer and charlatan. There is no record to that effect—except that he asserted, among other “impossible” things, that he could make diamonds by alchemical means (which Moissan and other modern physicists have since done on a small scale), and that his infinitely greater learning and variety of accomplishments than any other man of his time seemed too marvelous to be true and therefore must be imposture! Even the “*Encyclopædia Britannica*” grudgingly admits his vast knowledge, while automatically copying the unfounded stories of his being an adventurer of the eighteenth century. Whether he was or was not an adventurer does not in the least affect the status of his case as an authentic

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instance of enduring youth which had defied and surpassed middle age.

Saint-Germain spoke all the European languages fluently and almost without accent, as well as at least one Oriental language. He was a profound chemist. He was one of the best swordsmen of the time. He was a magnificent violinist and composed music. An old French nobleman, who in his youth had heard Saint-Germain play, said many years later of Paganini, "He plays as if he had in him the soul of Saint-Germain." He founded at least one hospital in Paris, gave lavishly to public charities, never borrowed money, and refused favors offered him by many kings and queens. He was the intimate friend of the Empress Catharine, Frederick the Great, Louis XV, the landgrave of Hesse, and many princes and powerful nobles.

Saint-Germain traveled much throughout Europe, and even made two journeys to visit the shah of Persia. A concrete part of his work appears to have been the founding of masonic lodges in many cities, a work far more difficult then than now, and in some countries only possible through the personal favor he enjoyed in royal circles.

The beautiful Princesse de Lamballe was one of the personal friends of Saint-Germain. He warned her of the impending fate of the royal family; but she refused to leave the queen, whose most intimate friend she was, and in consequence died at the hands of the mob on September 3, 1793.

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Another significant testimony as to his advanced age while he looked as if in the finest period of manhood is the following incident: The wife of the Austrian ambassador, an elderly woman, met the count at a reception in Paris. She told him she had known his father in Vienna about thirty years before. He assured her that it was not his father but himself, and, to her amazement, referred to a very personal conversation they had then had together.

Grim, in his *Correspondance Littéraire*," pays Saint-Germain the high compliment of saying that he was the man of the best parts he had ever seen. Leclaireur, in "*Le Secret du Comte de Saint-Germain*," says that he could repeat word for word the contents of a newspaper he had read several days before; also that he could write two different letters, using both hands at the same time.

As to his diet and habits, about all that is known is that he would never eat before others. He was a frequent guest at court and other banquets, but it was always with the understanding that he should not be expected to eat anything at table. He rested but little, but would often lie for hours at a time, absolutely relaxed, and almost as if in a trance, after which he appeared refreshed and brimming over with energy.

Among the unauthenticated stories about Saint-Germain is that of an old man in Paris who insisted that he had seen him in Milan seventy years before, but under another name. More than that, this old man

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asserted that at that time in Milan *another old man* had solemnly declared that he had seen him sixty years before in Sweden—and then as at Milan, looking exactly the same, attended by the same mystery, and apparently having boundless wealth.

It is hoped that this résumé of the life of the man then known as the Comte de Saint-Germain will serve the double purpose of (1) adding to the list of cases of abnormal longevity a new and extraordinarily interesting one, and of (2) offering a belated defense of his memory by showing that such a man could not possibly have been a charlatan—a libel passed along from pen to pen from the eighteenth century to our own time, and then automatically and stupidly copied without investigation by encyclopedias and writers of superficial and flippant magazine articles.²

² *References:* Isabel Cooper-Oakley, "The Count de Saint-Germain." Henry S. Olcott, "The Count de Saint-Germain," Adyar Pamphlet No. 90. Kenneth Mackenzie, "Royal Masonic Encyclopædia," p. 644. Jean Leclaireur, "Le Secret du Compte de Saint-Germain." Gräfer, "Mémoires." Friedrich Melchior, Baron von Grimm, "Correspondance Littéraire." Comtesse d'Adhémar, "Mémoires."

CHAPTER XII

THE ANTEDILUVIANS

The Bible account of the great ages of the antediluvians and their immediate descendants is now generally believed to be a myth, mixed up as it is with the allegory of creation in seven days, Adam and Eve, and the garden of Eden. Yet in spite of modern science and higher criticism there remains one aspect of the story that is not yet satisfactorily accounted for. Noah, the last of the antediluvians, is said to have reached the age of 950 years, a figure somewhat above the average before the Deluge. But afterward the ages of Noah's descendants steadily diminished so that Abraham lived only to the age of 175. His son Isaac lived to be 180, but his grandson Jacob died at the relatively tender age of 147, while Joseph came to an intemely end at 110. The interesting and obscure question to us in this connection is: at what point in this descending scale from Noah's age of 950 to Joseph's 110 did the Genesis narrative pass from fabulous or symbolic times to those of the later patriarchs and their immediate predecessors who have their parallels in the authentic records of modern times?

We may mention here that until recently the whole

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story of the children of Isreal in Egypt was considered a fable because there was then no scientific evidence to confirm it. But now it appears that certain later archæological discoveries seem to give strong support to the account in Exodus.

Psychoanalysis has already psyched almost everything worth psyching, and when it went into old traditions and folklore it found so many parallels with fantasy and day-dreaming that it took a kangaroo leap to the conclusion that *all* old stories and religious accounts were merely dreams and fantasies on large scales—racial compensation dreams. While we have profound respect for psychoanalysis, we incline to the belief that it has overworked this hypothesis, as we believe it has that of the Œdipus complex. Common sense tells us that every striking story or legend must have had its origin to some extent in facts or actual events, about which as time went on a mass of fantasies gradually accumulated. For example, the whole story of the siege of Troy was scientifically put down as a hero-myth until Schliemann's excavations revealed the actual ruins of the ancient Trojan city. As the personal gods of the Greek hierarchy of Olympus are probably the pale shadows of prehistoric kings, queens, heroes, and courtezans, so we now incline to the belief that the Bible story of the remote past of our antediluvian ancestors is a dim echo of a prehistoric time when earth was younger and mankind nearer to nature; when life was without special problems or stresses ex-

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cept the normal necessity for agricultural work; where there were mild climates, with wide spaces and plenty of room for all; no business cares and no courts or lawyers; a life mostly in the open air and under the life-giving sun.

Such an environment would give to human bodies the maximum benefit of normal and ideal living conditions, protection from the slowly poisoning influences that develop in communities—influences that bulk largely among the direct causes of middle age and old age, according to the latest scientific discoveries.

The conclusion is now unavoidable that if our bodies could be protected from the now definitely known causes of old age—namely, improper diet, chronic constipation, certain chronic infectious diseases, poisonous and habit-forming drugs, sustained worry and fear, and negative fixations in the subconscious mind as to the inevitability of the climacteric and senility—our bodies would not grow senile and, barring accidents, should live on indefinitely in almost changeless youth, strength, and beauty.

If there was a prehistoric time when human age was so enormously greater than now, the causes for its gradual shortening would appear to have grown out of the always greater stresses arising from overcrowding and from community life. From the less and less hygienic physical environment would gradually develop the mental and emotional stresses incident to closer and closer personal contacts and community and social prob-

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lems. The gradual transition from the ideal conditions of a care-free time to the social complexities and unhygienic surroundings of a later period would carry along with it a deepening subconscious fixation of an age limit for man based on his physical endurance limit under existing conditions, and of an age limit that would be always contracting.

Man's average age limit in the downward arc of the cycle apparently reached its lowest point somewhere about 450 A. D., and remained thereabouts for some eight hundred years. This long period of human obscuration corresponded approximately with the so-called Dark and Middle Ages, when civilization in Europe was at its lowest ebb; when tyranny, selfishness, cruelty, slavery, bigotry, ignorance, and pestilence were rampant. Then slowly, almost imperceptibly, the long black night of civilization approached its end, and the dawn of a new world day commenced. The Reformation and the Renaissance came; and in spite of almost continuous wars, civilization steadily gained, and with its gain came better and safer living conditions. The average age limit began to lengthen again. The following table will show the steady increase in the average human age from its lowest point in history to the present day:

| | |
|----------------------------|----------|
| Europe in the Middle Ages | 21 years |
| France, eighteenth century | 29 years |
| France 1859 | 40 years |
| United States 1915 | 48 years |
| United States 1925 | 55 years |

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The slow but definite increase in the human age limit from about 800 A. D. to the present time is very significant. Its coincidence with steady improvement in physical living conditions and knowledge of sanitation is the most positive proof that the average human age is not a fixed but a variable figure, something which varies directly with improvement in environment.

At this point let us cite once more the amazing fact that apparently under the influence of a special article of diet the small country of Bulgaria with a population of seven million has about thirty-seven hundred people who are more than one hundred years old—more perhaps than for all the rest of the census area of the world.

What is the obvious teaching of this Bulgarian wonder and of the rising age of man generally in the last thousand years? That man's age is a variable figure, depending on environment and diet. In the presence of these facts, who can say what age man may have attained in his unknown past, or what age he could attain in the future under ideal living conditions?

In sum: the facts just cited indicate inferentially that under ideal living conditions, in a prehistoric time, man's age could have been far greater than it is now. The occasional instances in modern times of men of 130 to 160 prove that the biblical ages of Abraham, Isaac, and Jacob were not at all improbable, and imply that they may have been the averages under living conditions better than are common at the present time.

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And if such great ages may have been the average some thousands of years ago, what may they not have been much further back into the immeasurable and immemorial past?

The Genesis account of the ages of the antediluvians and their descendants, however, is not the only record of human ages that seem incredible when contrasted with the brief span of three score and ten that has become the official and accepted and respectable age limit in Christian countries. The intermediate historical period between the uncertain records of the Old Testament and the times that we think of as modern contributes a large, though not nearly so well known, number of similar stories. The writings of old and medieval times have many references to instances of exceptionally great age. While we admit that much of it may be exaggeration, it seems unreasonable and inconsistent to regard *all* of it as such, in view of the comparatively modern historical cases of Czarten, Parr, Jenkins, Surrington, and Politiman. Let us mention a few of the alleged instances of ancient and medieval times.

The Athenian Onomocritus says that certain Greeks, and even whole families, maintained their youth for centuries. One Papalius was believed to be about five hundred years old. A Portuguese named Faria is said to have lived to the age of three hundred years. Strabo asserts that some people in the Punjab lived more than two hundred years. Roman statistics during the reign

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of Vespasian gave six who were one hundred and fifty or more. Lucian tells of an Indian people, the Seres, who attained to ages of three hundred years, which he attributes to their very temperate life and scanty food. Pliny mentions an Illyrian who lived to be five hundred. He also tells of a Cyprian king who lived more than one hundred and sixty years. Litorius of Aetolia is said to have reached the age of two hundred years.

This block of unauthenticated testimony should be looked on as collateral to the Bible story, and to some extent as support for it. In almost every one of these alleged cases of abnormal age there appears to be a background of simple habits of diet and of what may be called righteous living. In the main then we have again, as in Genesis, the same premises, sometimes racial, sometimes individual, of more wholesome and natural living conditions than the historical period can provide for community living. It would seem therefore that in the absence of actual proof we should look at the Bible accounts of human ages, and of the ages attributed to the intermediate period, as hypotheses which contain significant and valuable hints as to ways and means for preventing the onset of aging. With the facts now known, it seems to me that we should no longer regard even the ages of the antediluvian patriarchs as necessarily fabulous when under the ideal living conditions of a prehistoric period, nor impossible in a future in which like conditions were repeated.

CHAPTER XIII

THE PREVENTION OF MIDDLE AGE

The best way to cure a disease is not to have it, said an Irishman. That is just another way of saying, prevention is better than cure, which is the key-note of modern hygiene and sanitation.

We must not, however, jump to the conclusion that the idea of preventive medicine had its birth in our own generation. Great thinkers usually reach much the same conclusions from the same premises. This will be shown in a quotation from Paracelsus, a famous physician and philosopher of the sixteenth century, and one of the greatest and most illuminated men of all times :

Life itself is an emanation from the Supreme Power of the Universe ; but it requires a substantial vehicle for its manifestation. To prolong the process of life, we must try to protect the material form in which life is active against all injurious influences that may act upon it. We must therefore eradicate all physical and psychical diseases, and prevent all evils that are caused by age, occupation, or accidents. We should cause him to avoid immoderate eating and drinking, fatigue of body or mind,

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excessive joy or grief, or mental excitement of any kind. We must protect him against infections or epidemic diseases, whether they are of a physical or moral character, and employ such remedies as have been provided by Nature for such purposes.

The first and most obvious thing to do when about to begin preventive treatment against middle age will be to eliminate any and all foci of infectious diseases that we may have in chronic form, for such conditions are steady drains on our vitality. Any focus of chronic infection in the body is always giving off poisonous substances that interfere with nutrition and irritate the blood-vessels and ductless glands. Consequently if any one has such foci they should be cured or removed if possible. The commonest sites for focal infections are the teeth, the tonsils, the nasal sinuses, the appendix, and the gall-bladder.

The teeth are the most common and serious sources of chronic infection, and it is a severe commentary on public intelligence that this is so; for there are now plenty of good dentists, and any one who is able to read and write, and neglects his teeth, has no excuse but laziness. Even poverty is no longer an excuse, for good dentistry can be obtained free of charge in the dispensaries of dental schools.

Chronically infected tonsils come next and should be removed. They do not respond to medical treatment, and an examination by a specialist will nearly always show them to be full of pus. Such infected tonsils,

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like infected teeth, have much to do with causing chronic rheumatism, and, secondarily, heart and kidney disease.

Nasal sinus diseases are often very hard to cure, but a good specialist can always improve them and frequently cure them entirely.

Chronic appendicitis and inflammation of the gall-bladder with gall-stones are always dangerous conditions and are likely to flare up at any time without warning when a good surgeon may not be available. As a rule they are incurable by medical treatment alone. Experience shows that it is less risky to have them removed than to leave them in. Some believe that these two organs have important functions, but prolonged observation of many cases proves that nearly always after their removal the improvement is so marked and durable that the delighted patients regret they did not have the courage to have themselves surgically attended to long before.

The injuries so commonly sustained by women during childbirth often leave permanent sources of physical weakness and chronic inflammation, which, if neglected, grow gradually worse, irritating the nervous system and depleting the vitality until life becomes little better than a burden. Moreover deep tears in the uterine cervix never heal spontaneously but become chronic ulcerated surfaces, which, after a variable time, are prone to develop into that most dreaded disease, cancer of the uterus. Every woman who has borne children

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should always be on the alert for menstrual irregularities, hemorrhages—especially between periods—and chronic discharges. All such *may* be danger-signals of the gravest import, and to neglect them may be to invite a slow and horrible death. Too often women put off going to a surgeon until the disease has progressed beyond his power to save by operation. The cancerous stage may not come for many years, or may never come; but on the other hand it may *already have started*. *Every old cervical tear is a potential cancer*. The repair operation is without danger and is a permanent cure—*when* performed by an experienced surgeon.

Old perineal tears, or outer tears, do not tend to become cancerous, but they wear women down physically by weakening the pelvic supports and giving a feeling of fatigue and a tendency to chronic constipation. One of the most satisfactory things in a surgeon's experience is to see the quick all-around improvement in women who have been surgically relieved from the miseries and bad health and dangers incident to neglected cervical and perineal tears.

Having got rid, so far as possible, of chronic foci of infection and depreciation, the next thing to consider is the best time, or times, for beginning and carrying on the new method of preventive treatment. This may at first thought seem rather odd, but there is good authority for it.

Nature's Rhythms. On large scales nature works in regular periodical rhythms—as the succession of the

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seasons, day, and night, and the astronomical movements. In the East it has long been believed that certain times or seasons are more favorable than others for man's health and progress. The fundamental idea involved in that belief is that man is the miniature, the microcosm, of nature; and therefore when men deliberately time their efforts with the definitely progressive rhythms of nature, they get into line with nature, as it were, and are then carried along with the least amount of personal effort. Obviously the spring is nature's most progressive time in almost every way, when the earth teems with the coming harvests. If there is anything in this theory as applying to man, the spring would of course be the best time for gaining health and strength and growth; and anything like a new system of living, or a new method of treatment, would be likely to give fuller results then than at other times.

It is interesting to observe that Western science is beginning to accept this Eastern theory. Stanley Hall, in his monumental work, "Adolescence," cites the reports of several observers which show that the growth and development of children coincides with certain months of the year. The greatest growth in height occurs from April to the middle of August. The least growth in height takes place from the middle of August to near the end of November. The middle period of growth is during the four months to the end of March. Increase in weight takes place in the reverse order.

"Again," says Dr. Hall, "adults probably tend to

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grow thin at the same period when children tend to grow tall; and also to grow thick when children grow long. By choosing the former period for cures, fleshy people can aid Nature."

The following quotation comes from another school of thought; it is the advice of an East-Indian yogi to a pupil:

As the green leaves are sprouting and blossoming on the trees, so may your souls open out and blossom during the coming year. This is the season for the blossom and the fruit. Expand in the sunshine and forget the repression of winter. Now is the time for growth and harvesting. Thus may new strength, new life and joy be yours. Learn to live in and with the season. Be one with Nature, and she will be your friend and benefactress. She will renew you and keep you young. This is the secret of youth eternal. First in the heart, and then also physically. Practise it first in the heart that you may know it truly, for nowhere else can it be real. You may think this sounds simple. It is—like all the eternal verities—so simple that you do not grasp it. If you did, old age would lose its terrors and youth would be eternal.

Here then we find substantial agreement between Eastern and Western thought as to the spring as the best time for beginning any new and constructive treatment or mode of living. When Dr. Hall says, "Adults probably tend to grow thin at the same period when children tend to grow tall," he means that adult thinness is not

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loss but gain; gain in the loss of superfluous or pre-senile fat. Moreover he says that "fleshy people can aid Nature" by choosing the spring or trying cures. By "fleshy people" is usually meant middle-aged people; or to be more exact, pre-senile people whose signs of senility are deposits of unwelcome and unsightly fat.

In the Eastern teacher's words, "Practise it first in the heart, that you may know it truly, for nowhere else can it be real," we find in poetic language the advice to rid our subconscious of the old-age bogey by *knowing in our hearts*—that is, *realizing* mentally and emotionally—that aging is not natural necessity, and that youth *can* be, if not eternal, at any rate greatly prolonged. Yet clear and definite as this is, it is, as he says, "so simple that you do not grasp it." To our practical concrete Western minds it is also likely to be so simple that we do not grasp it—that he tells his pupils to make efforts to renew their strength and *youth* in the *spring*—the time of the blossom and the fruit—when the sun is moving northward—when all nature is pressing forward and expanding.

It should not be necessary to say that this advice is not intended to be construed as meaning that common-sense treatment should be deferred until the next spring, if, for example, one should happen to read this book first in the summer-time and be interested enough to take up treatment. In the present very imperfect state of scientific knowledge of the relations of nature's rhythms to physiology, the sensible thing to do would be to

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begin such treatment just as soon as one became convinced that it was worth trying. However, from what has already been demonstrated as to the greater growth of children in the spring, and the better results from fat cures then, the presumption is that the preventive treatment of senility should also be more effective in the springtime.

Before ending this chapter I want to emphasize that any one who decides scientifically to resist the advance of middle age should always consult a first-class physician and have a thorough examination. Any incipient beginnings of diseases like tuberculosis, nephritis, or diabetes mellitus would then be found. The presence of such diseases would have an important bearing on diet and exercise, even though the common-sense dietary regimen for deferring senility would in itself be far better than the average careless way of living.

CHAPTER XIV

FACTS ABOUT FOODS

Natural and rational treatment of any chronic disease should nearly always begin with correction of the diet. Middle age is a chronic disease, and in no other disease is diet so important, both in the preventive treatment and in the disease itself. In the chapters on the glandular secretions and on drugs we have already referred to some extent to the effects of meat, of milk and other dairy products, and of vegetable diet. We must now take up these divisions of diet one by one and somewhat more in detail. Let us begin with meat.

Meat. In most of what we call the civilized world, meat is thought of as an essential part of human diet. There are several strong reasons—on the surface—for the almost universal belief. Meat is food in very concentrated form. It is easily and almost completely digested—that is, when digestion happens to be functioning well—and leaves almost no residue to speak of, compared with vegetables. It has relatively high food value on account of its concentration, and it directly builds up tissue. It is easily available to all who can afford to buy it. Its quality and sale are under more

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or less strict supervision in most cities, and consumers are largely protected from the dangers of spoiled or diseased meat.

With such a list of recommendations, one who looks no further could not reasonably find fault with meat as an article of diet, except for esthetic or sentimental reasons. But there is something more to the question. In the first place it is now proved that meat eating is not essential to health and strength. The fundamental constituent of meat, its proteid or albumen, is abundantly supplied by milk, eggs, beans, peas and lentils, and nuts. Experiments have proved that perfect health and capacity for hard labor can easily be maintained without taking any meat whatever. In support of this it is only necessary to mention that the mountaineers of Japan are among the hardiest and most enduring of men, and that they very rarely get a chance to eat either meat or fish. Once we rid ourselves of the obsession that meat is necessary for health and life, and that there are no other efficient substitutes for it, our minds will be ready for the examination of the other side of the question, the harmful effects of meat diet.

Medical science definitely knows that meat diet is harmful and dangerous in the presence of a number of diseases; notably in nephritis (Bright's disease), liver disease, goiter, heart disease, diabetes, arteriosclerosis, rheumatism, and gout. So certain is this knowledge that one of the best authorities of the U. S. Public

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Health Service—Victor Heiser, a man of international reputation—told me that in all cases of chronic rheumatism his main advice and treatment is simply this: *stop eating meat*.

The extractive substances of meat—particularly of the red meats and red fish—increase blood pressure and irritate the vital excreting cells of the kidneys. These facts alone forbid the eating of meat to those with kidney and heart disease, except in so far as they wish to commit suicide.

In Chapter II it was said that the process of aging consists of overgrowth of fibrous connective tissue at the expense of the functional tissues of our vital organs, and also a gradual precipitation of insoluble particles within the tissues themselves. I am informed by Dr. C. Robert Moulton, director of the department of nutrition of the Institute of American Meat Packers, that the percentage of ash in animal flesh does not vary with age after the earliest part of the animal's life has passed. Yet all animals grow old, and old domestic animals obviously become senile. The presumption is therefore that some of the meat sold as food has small amounts of its ash in the form of precipitated matter. If so, when such meat is eaten, this fine precipitate would be liberated in the processes of digestion and might to some extent be passed into the blood. Once in the blood it would be suspended in that colloidal fluid like an emulsion and carried to the most remote organs, where it might be screened out, as it were, in the

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microscopic network of tissue fibers and left there. This is only suggested as a hypothesis, in the absence of definite experimental data.

People who are heavy meat-eaters feel dull and logy after a hearty meal of meat. Most of us are in the habit of looking at these after-effects of meat diet as normal reactions, indicating that nature intended that we should always sleep after hearty eating; that is, those of us who do not need to earn our living by hard manual or physical labor. This complacent view of the lethargy which usually follows heavy meat eating is one of the many popular misconceptions about eating and drinking. The fact of the matter is just this: the feelings of lethargy and dopiness after taking much meat are nothing more or less than symptoms of *poisoning*. Mainly on the liver, thyroid gland, and kidneys falls the responsibility for protecting the body as a whole from poisons brought into the blood from the food itself, and from decomposition of food—meat food especially—retained too long in the intestines by chronic constipation.

Excess of meat is not so serious in men who have to work hard, because physical activity keeps up the circulation and brings more oxygen into the blood, thereby more quickly burning up and destroying meat poisons and helping out the liver and thyroid gland. But with people who do not have to work hard after eating, or whose work is all mental work, the circulation slows down and tends to stagnate. The poisons

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are then longer in contact with the tissues and soon indicate their presence by reason of mental slowness and physical fatigue.

It has been proved that meats, especially the red meats, are rich in extractive substances, which irritate the vital tissues and raise blood pressure as has been mentioned before, and which therefore are essentially poisonous. Animal experimentation gives clear proof of this. The thyroid gland is the main internal bulwark against poisons introduced into the blood. Animals whose thyroids have been removed develop myxedema and soon die, unless artificially fed with thyroid extract. But such animals live and thrive fairly well if kept on milk diet. The reason they live is because *milk contains thyroid extract*. Now when such mutilated animals are fed meat, *they develop myxedema and die*. Here is positive proof that meat contains poisons, which the liver alone cannot take full care of at the portals of the blood-vessels, and which in the absence of the thyroid gland, or disease of it, will poison and destroy the body.

It is obvious then that when we feel heavy, dull, or stupid after a meal of meat, we are not experiencing a healthy reaction but have taken into our bodies an excess of poisonous material over the capacity of the thyroid to neutralize, and which must irritate and to an extent seriously injure our vital organs. The constant repetitions, day after day and month after month of these meat poisonings progressively injure and deteri-

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orate all our functions, until, before we know it, the brand of senility is upon us.

It has been found that white meats are less objectionable than red meats, as they contain less of irritating extractive substances. Therefore people who are addicted to heavy meat diet, and think they cannot live without it, would do well to eliminate red meat from their diet and substitute for it white meat or fish. Sausages are of course in the class of red meat.

Fish is actually a kind of meat, but, like the white meats, it lacks irritating extractives—except salmon and carp, which are more like the red meats in constitution. Another advantage of fish over meat is that fish contains less ash than meat; and still another, that all sea-fish contain traces of iodine.

Most centenarians are not meat eaters to any extent, and many of them have been virtually vegetarians. But now and then we meet with well preserved old people who do eat meat, or drink whisky, or smoke or chew tobacco. We should not be deceived and draw general conclusions from such cases, however. The personal equation must always be taken into account. Individual resistances to the poisonous effects of certain articles of food and of habit-forming drugs are sometimes very great. It will almost always be found in cases of persons whose youthful looks have been preserved, if they are careless in their habits, that they have two strong safeguards; namely, (1) good digestion and daily evacuations, and (2) good sleep and freedom

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from worry. Therefore instead of looking at such cases of intemperate habits as arguments for intemperance, we should rather say to ourselves, "If this man holds his own physically with his bad habits, how much younger would he look if he lived moderately and intelligently?"

Red meats and their extractives should be definitely given up by old people, because these extractives increase blood pressure and thus put extra pressure on their more or less hardened and brittle arteries, and strain hearts whose elasticity is already weakened by overgrowth of connective tissue and by insoluble deposits.

Fish, being more tender, holding more water, and having less of extractives—except red fish—is therefore better for the aged than meat. Indeed fish is always preferable to meat as proteid food. Moreover it should be remembered that while proteid food is essential in youth, while the body is being built up and while it displays much activity, it is not necessary for the old except in small amounts.

Never forget that aging may be said always to begin in the walls of the arteries, and that the cause is poisoning of the blood and stagnation of the circulation. Note well what Lorand, the Czecho-Slovak authority on aging, says in this connection:

The gravest danger to the circulation apparatus lies in meat, for . . . the viscosity of the blood is thereby

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increased . . . and its circulation through the blood vessels impaired.

And yet after Lorand has built up a most damning argument against meat in diet, he seems to hesitate or lack the courage of his convictions to advise that meat be entirely given up. Perhaps this is in line with his cautious warning in his preface not to hope for more than ten or at most twenty years' reprieve from our sentence of senility—*before* he advances experiment after experiment and fact after fact that seem to give us ground for greater hopes.

Here is an appetizing thought for those who love to roll their tongues over luscious morsels of rare meat: modern investigators have found that the so-called fresh meats, and also salted meats, contain enormous numbers of *living* putrefactive bacteria. Indeed Roderick, Marxner, and others have proved that some meats, such as Hamburger steak and liver, contain an even greater amount of putrefactive bacteria than does the *fresh dung of animals*. Even cooking does not kill *all* living bacteria—as Reed has conclusively shown, in his work to which we shall refer presently—nor does it materially neutralize the intense poisons already excreted by the bacteria before they were killed.

The following figures compiled by Roderick show the comparative germ content of "fresh" meats and of animal dung. The figures speak for themselves:

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| MEAT | BACTERIA PER GRAM |
|-----------------|-------------------|
| Beefsteak | 1,500,000 |
| Pork chops | 2,900,000 |
| Beef liver | 31,500,000 |
| Corned beef | 31,000,000 |
| Hamburger steak | 75,000,000 |
| Pork liver | 95,400,000 |
| Calf droppings | 15,000,000 |
| Horse droppings | 25,000,000 |
| Goat droppings | 69,000,000 |
| Cow droppings | 80,000,000 |

The above figure for Hamburger steak does not seem to do it full credit, for Weinzirl and Newton found Hamburger steak with as many as 525,000,000 putrefactive bacteria to the gram. When such reliable observers say in so many words, "Meat containing 10,000,000 per gram is potentially rotten," we can hardly continue to think of Hamburger steak and like meats as fit for human food, but rather as carrion, fit only for vultures and hyenas.

I shall add one last indictment against meat which certainly is not the least. It is very common and very natural belief that when meat is cooked all living disease germs are killed. Unfortunately, however, this comfortable belief is effectually disposed of in a cold-blooded syndicated article of very recent date by Dr. Charles A. L. Reed, formerly president of the American Medical Association. Dr. Reed cites experiments which demonstrate the following points:

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1. The bacilli of tuberculosis have a waxy capsule which insulates them from heat destruction to a greater extent than we have formerly believed.

2. Meat is a very poor conductor of heat, which means that although the surface of cooked meat may be sterilized, the central parts are not necessarily so.

3. Boiling for forty-five minutes does not heat meat to more than 167 degrees, and this only in thin slices.

4. The interior temperature of boiled ham does not reach a higher temperature than 149 degrees. Quickly roasted sausages only reach eighty-four.

5. Large pieces of pork only reach 140 after boiling half an hour, and the central parts only heat to 131. A temperature of 176 is only reached after boiling some hours.

6. The highest temperature in the center of a well baked meat pie is only about 116.

7. Ordinarily cooking kills tubercle bacilli only in thin slices of meat, and not in the deep parts nor in the center of joints and in meat pies.

8. Freezing, brine, hanging, and even putrefaction do not kill tubercle bacilli.

It has long been known that more than fifty per cent of all persons develop foci of tuberculosis in their lungs at some time in their lives. Tubercle bacilli have never been found free in nature, and it has always been presumed that most of the infections came from the sputum of patients or from infected milk. Dr. Reed's valuable paper now shows us the probability that much

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or most tubercle infection comes from the cooked meats eaten in the false belief that ordinary cooking kills tubercle bacilli. If this is true for "well done" meat, how much more so for rare meat?

Milk. As scientific knowledge accumulates in regard to digestion, nutrition, metabolism, and the chemistry of foods, milk assumes an ever growing importance as an article of diet.

In the first place, milk contains nearly all the elements of human food in about the best proportions for taking into the body. It is therefore, in itself, an almost complete food for any one.

Besides being a complete food, fresh milk contains substances that can kill the bacteria of several severe diseases. But these germicidal properties are destroyed when milk is heated above sixty degrees centigrade. They are at their best in raw milk.

Then there are certain ferments in raw milk which greatly help digestion, but these also are destroyed by heating above seventy degrees centigrade. Pasteurized milk if not heated above seventy is asserted still to contain active amounts of these ferments.

At one time it was thought that boiled milk was as good as raw milk, but more recently it has apparently been demonstrated by many observers that much of the value of milk is destroyed by boiling, or even by heating above seventy-five centigrade. The observations covered children and animals, but with the latter it was a matter of direct experimentation and

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checking by means of control animals. It was shown that calves fed on boiled milk did not thrive well. Later on they developed rickety deformities of the bones, and also scurvy-like conditions. Most of the calves fed on boiled milk died of exhausting diarrheas, exactly as many infants in large cities die when deprived of mothers' milk or raw cows' milk.

The lesson in this is that raw milk is far superior to boiled milk or condensed milk, both for children and adults. But there are difficulties in the way of furnishing safe raw milk that make it impracticable for milk companies to dispense it on a large scale. The only safe alternative is to use pasteurized milk from a reliable firm—unless one has the good fortune to be able to get raw milk from a reasonably safe source.

Again milk in its raw state has also the vitamine bodies which are so essential to nutrition. It is asserted that Vitamine B is not destroyed by pasteurizing.

Finally, and in a way most important of all, raw milk contains active extracts of the various ductless glands. While this fact is demonstrated in laboratories, a striking practical proof is that in cases of congenital myxedema children live and thrive well on mothers' milk; but when they are weaned the symptoms of myxedema return. This proves that thyroid internal secretion is contained in mothers' milk.

All things considered, we have in milk an ideal article of diet. It contains in their normal proportions the

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three great classes of foods, digestive ferments, vitamins, and the vital extracts of the ductless and other glands of internal secretion which neutralize food and disease poisons. The only element that is markedly lacking is iron, but that is easily supplied by many other foods, notably eggs, spinach, and tomatoes.

The modified forms of milk are also extremely valuable, and we shall turn now to their consideration. Bulgaria is a relatively small country. Many Americans are not even certain just where it is on the map. During the first Balkan War Bulgaria aspired to dominate the Balkans. But when she and her allies fell to squabbling among themselves over their territorial gains, the Turk smiled and quietly took back his ancient holy city of Adrianople. Bulgaria joined the Central Powers with the promise that when the war was won she should then dominate the Balkans, and incidentally pluck her neighbors and former allies like New Years' geese. Now for the moment the least of the Balkan powers politically, Bulgaria nevertheless holds a peculiar distinction which not even the greatest and most powerful nations can even approach. That distinction is the exceptional prolongation of human life. Several years ago Germany, with a population of more than sixty-one millions, could only show seventy-one persons more than one hundred years old. Bulgaria, with a population of about seven millions, had then more than thirty-seven hundred who were more than one hundred years old.

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Such astounding figures indicate far more than mere coincidence. They mean nothing more or less than that people who live in Bulgaria live under conditions that somehow prolong life far beyond the ordinary averages. Now what are those conditions? Science has apparently ascertained what they are, and moreover that they can be provided elsewhere than in Bulgaria.

The cause of the enormously greater number of centenarians in Bulgaria is apparently an article of diet that seems to have originated in that country. It consists of a kind of fermented milk called yogurt. This yogurt has the remarkable power of transforming cultures of disease bacteria in the intestines into harmless substances. The beneficent action of yogurt seems to be a process similar to lactic acid fermentation. Careful experiments have proved that when yogurt is taken daily it diminishes putrefaction in the intestines. Meat diet causes the greatest amount of putrefaction because dead meat is a natural culture medium for bacteria. All of us are unpleasantly familiar with the appearance and stench of rotten meat outside the body. But the only difference between rotten meat outside and inside of our bodies is that we cannot see and smell that which is rotting in our intestines—particularly when we are constipated. During constipation after a meal of meat, what actually happens is that putrid stinking masses of undigested meat, instead of being eliminated before becoming very rotten, now ooze out their ichorous fluid

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into the blocked-up intestine; and, being unable to get out, that loathsome corpse juice is backed up and overflows into our blood—there to irritate the walls of our arteries and the functional tissues of our most vital glands, and to start us along our course toward premature old age.

Now it fortunately happens that Bulgarian yogurt is able to check to an extent the putrefaction of meat in the intestines. It is doubtless largely due to this one fact that Bulgarians live so much longer than other people. To a lesser extent ordinary sour milk is believed to produce similar results. Consequently sour milk and whey are excellent articles of diet, though not very popular. The same is of course true of buttermilk, and its power to check intestinal putrefaction has been conclusively demonstrated in a well known laboratory. A piece of tainted meat was put into a bottle of buttermilk seventeen years ago. Every seven days the buttermilk was renewed. The experiment is still in progress, and the original piece of meat is still in the bottle.

This peculiar property of yogurt—and it would seem also of buttermilk—makes it especially valuable for people who eat much meat. To them it is a true life-saver. But to others who decide to do their utmost to stave off middle age, yogurt should have some of the properties of an elixir of life and youth. There are several substitutes for yogurt which probably can do no harm, and perhaps much good. But the genuine

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Bulgarian ferment should always be used if it can be got, in preference to substitutes.

Instead of having to bother with the preparation of yogurt milk, the pure Bulgarian ferment can now be had in tablet form. When taken together with milk at meals the culture grows in the intestines and produces the ferment in amounts sufficient to check putrefaction to a large extent. These Bulgarian tablets can now be found in all large drug-stores and should be kept in an ice-box..

Among the many strong testimonials to the value of milk, none is better than the oft-observed fact that almost all cases of severe chronic indigestion, and even of stomach and intestinal ulceration, immediately begin to improve when put strictly on milk diet. Those who have the will power to continue such treatment for a long time will usually get well without surgical operations or any medicines, except iron in which milk is deficient, and laxatives as needed.

Bacillus Acidophilus. Much in the same class with the Bulgarian yogurt ferment appears to be a ferment known as the *Bacillus acidophilus*. The most recent studies indicate that this ferment is always present in the intestines to some extent, and that its growth can be so stimulated by certain articles of diet that after some days it will almost displace all other intestinal flora, including the age-producing bacteria of putrefaction. Professor Torrey of Cornell University reaffirms the claims of Rettger and Cheplin that the car-

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bohydrates lactose and dextrine, when taken in sufficient amounts, rapidly bring about the dominance of the *Bacillus acidophilus* over all other intestinal bacteria and animal parasites. This change of the intestinal flora may mean, Professor Torrey thinks, "a possible way of escape from the tyranny of troublesome intestinal bacteria—and their name is legion." Among the beneficent results already claimed to have been accomplished by this transformation are many cures of obstinate cases of chronic constipation, chronic diarrhea, and mucous colitis.

Another important point emphasized is that meat eating hinders efforts to change the character of the intestinal flora, even when large amounts of lactose and dextrine are being taken.

The acidophilus ferment differs practically from the Bulgarian ferment in that its tablet preparations appear to be almost without value. So far the best method of rapidly crowding out other intestinal bacteria seems to be by eating relatively large amounts of lactose and dextrine. The Battle Creek Food Company makes a convenient preparation in twelve-ounce tins which can be got at all drug-stores. Probably there are other preparations just as good, but the Battle Creek Company is cordially welcome to any advertisement this statement may give it.

Vegetable Diet. There is always some disagreement among physiologists as to whether man belongs in the class of carnivorous or herbivorous animals.

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The formation of our teeth certainly gives us the capacity to tear and chew meat. Whatever his true place in scientific classification, primitive man was certainly a meat eater by preference, whenever he could get meat. But as man advances in civilization and in knowledge, our general tendency is to eat less and less of meat and more and more of vegetables, fruits, and cereals, augmented liberally by eggs, milk and other dairy products.

Let us now briefly examine the advantages and disadvantages of a vegetable diet, in the light of present scientific knowledge. In the first place, most vegetables contain a considerable amount of fiber which is not digestible to any large extent in human intestines. But this quantity of refuse has a high *mechanical* value in that it helps to overcome intestinal inertia and to bring about regular and ample bowel movements.

Green vegetables tend to increase or to maintain the normal alkaline reaction of the blood, and thus to keep up the degree of fluidity of the circulation necessary for the rapid diffusion of nourishment to all tissues, and the corresponding elimination of waste products through the kidneys, skin, and lungs.

The carbohydrates of vegetables can be eaten in large amounts, says Lorand, without causing obesity—if only meat is not taken at the same time, except in very small quantities. Vegetable diet diminishes intestinal putrefaction; and therefore, as we should naturally expect, arteriosclerosis, a definite sign of senility, very seldom occurs among vegetarians. Another thing worth not-

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ing is that diabetes mellitus is uncommon among vegetarians.

While some vegetables, such as beans, peas, and lentils, contain even more proteid or albumen than meat, it is the opinion of most dieticians that a strictly vegetable diet is not as wholesome as when supplemented with certain animal products—eggs, milk, cheese, and buttermilk. It is well to remember that some vegetables are richer in iron than others, notably oatmeal, whole wheat, peas and beans, raisins and prunes, and spinach. Again, as to the vitamins: Vitamine A is abundant in spinach, cabbage, celery, and lettuce. Vitamine B is in most vegetables, except the modern denatured foods, of which more will be said presently. Vitamine C is strong in lemons, oranges, tomato juice, and in fresh vegetables generally, and tends to promote good appetites. Organic iron is especially abundant in artichokes, which are very popular in Italy for all persons who show signs of anemia. One of the reasons that a strictly vegetable diet is not so good as when milk, cheese, and eggs are added, is that such diet of vegetables and fruits seems to be somewhat lacking in the peculiar ferments and vitamins that are so abundant in milk. Summing up our most up-to-date information about diet and health, Lorand says:

Eggs with milk, carbohydrates, and fat together constitute a food which, in our opinion, is the most perfect,

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and one which will enable us to live a longer life in perfect health, even with a complete exclusion of meat.

Clear and definite as is the last quotation from this eminent authority on diet, still more significant to us are his conclusions as to diet in reference to aging:

But the greatest advantages of a vegetable diet are seen in the prevention of the ravages of old age by this means. By the use of such a diet we can, to a certain extent, check the degeneration of those organs which play the most important pathological rôle in the development of old age—thyroid, liver and kidneys.

Denatured Foods. And now we come to a consideration of great importance for all whose diet is vegetarian or mainly so. An hundred years or so ago an over-fastidious and neurotic English nobleman somehow got the notion of having his bread perfectly white. After him others tried it, and from those very small beginnings came the present-day colossal development of the milling industries for the sole purpose of whitening or "refining" wheat, corn, rice, and sugar. In recent years it has been proved by the most complete experiments that the so-called refining processes take from the grains substances that contain their vitamins and mineral salts that are essential to health and normal development. Furthermore it has been just as clearly proved that certain serious diseases, which were formerly believed to be infectious, are caused solely by diets largely made up of these "refined" or rather denatured

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foods. Such diseases are now properly classified as deficiency diseases.

Thus beriberi is now known to be a result of a diet composed mostly of polished—and therefore denatured—rice. Goldberger of the Public Health Service apparently proved that the terrible disease pellagra in our Southern States was due to lack of essential food elements in a diet made up principally of “refined,” whitened, corn meal and wheat bread.

Animal experiments have proved that animals fed exclusively on white bread will soon die, while others fed exclusively on whole-wheat bread live and thrive indefinitely. Certain animals fed on denatured white cereal foods soon develop polyneuritis and die, while others fed on the whole-wheat grains live and grow normally.

The remarkable and ridiculous part of the situation is that when those of us who know better desire to buy natural flour, rice, corn meal, and sugar, we have to pay more for them than for the wretched denatured articles. It is encouraging to observe, however, that a new movement is now under way in France to substitute whole wheat in bread for the sterilized and denatured white flour that is still the rule.

Another possibly very serious consideration is the relation of cancer to denatured foods. Some students already regard cancer as a deficiency disease. However that may be, it is generally admitted that cancer has apparently increased enormously during the last

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seventy or eighty years. It may be only coincidence, of course, like the corresponding growth of the telegraph system ; but there is no doubt that the increase of cancer does correspond approximately with the development of the food-refining industries throughout the civilized world.

An amusing development in America is the recent announcement of the Wards to attempt to make white bread of as good food value as whole-wheat bread by adding to their white bread amounts of vitamins equal to what is taken out in the milling. Of course this is a praiseworthy effort—to sell vitaminized bread instead of the flimsy stuff formerly sold to a deluded and ignorant proletariat. But what a lot of lost motion!—and all for the purpose of keeping up as long as possible the delusion and silly demand for white bread! Why not make whole-wheat bread directly in the first place? The plan is on a par, however, with many other commercial absurdities in regard to food which waste enormous energy and involve endless circumlocution. For example, sugar consumption in Hawaii. Sugar is raised in the different islands and extracted in the raw or natural state in plantation plants. It is then loaded on freight-cars and taken to the island ports. Next it is put on board inter-island steamers and sent to Honolulu, where it is transferred to deep-water steamers and shipped to San Francisco. From there it is freighted to inland sugar refineries, where it is thoroughly denatured. After that, the amount that is

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destined for consumption in Hawaii is sent back to San Francisco by railroad, shipped to Honolulu, and transhipped again among the other islands whence it came.

The action of the Wards, however, is a significant sign of the times. They have the foresight and sense to realize that when public education reaches a certain level, white flour and white bread will have to go, and when that time comes they will not be caught napping.

Fruits. A vegetable diet of course includes fruits. Fruits tend to maintain the alkalinity of the blood, and to act as natural laxatives. Bananas are very nutritious but differ from most fruits in that they tend to constipate. Abundance of fresh fruits cannot be too strongly recommended. While stewed fruits may be enjoyable and economical, they cannot be compared in value with fresh fruits, which contain natural ferments, vitamins, and the principle of life itself. Plenty of fresh fruit daily is one of the best and most natural ways to keep healthy and sound, and to conserve youth and youthful looks.

Fruits and Chemical Equilibrium. Probably the most important and vital function of fruits in diet is to maintain the chemical equilibrium of the body. This equilibrium is normally alkaline. All proteid foods—meats, fish, eggs, etc.—produce acids in the body. So also, but in lesser extent, do the cereal foods, on account of their considerable proteid content. Normally these protein-acids are all neutralized by the counterformation of alkaline substances. The main sources

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of the alkalis of the body are fruits and vegetables. Most fruits contain organic acids, which, however, are so acted on by the alchemy of the body that *alkaline* substances result. The organic acids of fruits are in this respect the reverse of the inorganic mineral acids—such as hydrochloric—which tend to make the body reaction acid.

Every one nowadays has heard something about acidosis—which may be said to mean in understandable terms an excessive formation of acid substances within the body, and which in consequence puts an excessive strain on the alkaline producing and protecting agencies. Acidosis, in the common form understood here, is induced by an unbalanced diet in which proteid foods are eaten to excess, or, in other words, from an abnormally low carbohydrate (starch) diet. Acidosis is a frequent and bad symptom in Bright's disease (nephritis) and diabetes—both of which were probably largely caused in the first place by habitual diet with excess of proteids and consequent intestinal putrefaction and excess of acid formation.

In sum, during the entire normal life there is a constant chemical battle going on between acid formation and alkaline formation, with the latter always a little ahead; otherwise death would result. Indeed it is not too much to say that normal vital activity is a condition of compensated acidosis.

It will now be clearer just why a balanced diet is essential to health and to continued life and to con-

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servation of youth. Proteids are necessary to build up tissue. But proteids increase acid formation. Fruits and vegetables give rise to alkalies, and therefore are the natural antagonists of body-forming acids. Moreover fruits and vegetables supply the starches and sugars which make the energy and heat of the body—as coal does to a boiler. The fats of the body are partly obtained from the fats eaten and partly from transformation of starches and sugars eaten. For a time the necessary fat *can* be derived wholly from the carbohydrates and proteids, but that puts dangerous strain on the equilibrium-protective agencies, and if kept up indefinitely may do serious harm. Hence fats, such as butter, should be a part of every one's diet.

Not everything is yet known about fruits, however. "There is still a great deal of confusion as regards the composition of the various food materials. . . . This is, however, being rapidly corrected. . . . Plums, prunes and cranberries, altho yielding a basic ash, increase the acid formation owing to the benzoic acid content."¹ From this it would appear that certain strongly acid fruits, such as pineapples, grape-fruit, and tomatoes in addition to the three just mentioned, may be more acid-forming than alkali-forming—and this seems to fit in with the rather unpleasant effects felt by some persons after eating such fruits—particularly before a breakfast of cereal food. When there is or seems to be this acid-starch antagonism toward some

¹ Friedenwald and Ruhrah, "Diet in Health and Disease."

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particular fruit, it would probably be as well to respect it and humor one's idiosyncrasy.

Speaking of idiosyncrasies, however, we are advised by an authority on food and diet that it is no longer considered to be scientific good form to have an *idiosyncrasy* in a matter of diet. The proper thing now is to be "sensitized" toward a food article or drug or gas. But although the latter word does convey more scientific meaning to a physiologist, it means nothing in particular to a layman, while the word "idiosyncrasy" does. We shall therefore continue to use it in this connection.

Generally speaking as to fruits, however, the main point to remember is that "most of the alkalis are furnished by fruits and vegetables, and potatoes, oranges, raisins, apples, bananas and lettuce are very useful in reducing the acid output." ²

Eggs and Cheese. Eggs and cheese have already been dealt with to some extent in the course of the sections on Milk and Vegetable Diet and elsewhere. Both are rich in albumen. The yolk of eggs also contains considerable iron in organic form, and thus is one of the best sources from which the iron of the blood can be renewed. Eggs have no poisonous extractives or precipitated material or ash like meats. Cheese has ferments which are valuable in checking intestinal putrefaction. Eggs and cheese, with milk, are ideal foods to round out a vegetable diet. Eggs in excess,

² Friedenwald and Ruhrah, "Diet in Health and Disease."

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however, are very apt to cloy, to produce indigestion, constipation, and even some intestinal putrefaction. Also, the kidneys are always irritated by the waste products of excessive albuminous metabolism. Hence if there is any degree of chronic nephritis already present (kidney disease) eggs should be taken sparingly and under medical supervision.

Fats. Since fat is one of the three essential elements of food, and is mostly derived from meat in the diet of many or most Americans and Europeans, its presence must be assured in the diet of vegetarians and others who do not eat meat. While some vegetables have fat in small amounts, our best and most wholesome source of fat is butter. Of course we get some fat in the cream of milk, and much of our body fat is manufactured in the assimilation of carbohydrate foods. But we need more than that, and butter is in every way the best form of fat for our needs. Moreover butter is rich in Vitamine A, a fat-splitting vitamin essential to nutrition.

How Much not to Eat. A consideration that must come in the course of this study is that after maturity most people eat far more than their grown and fully developed bodies actually need. It is easy to understand that the growing bodies of children require relatively more food than adult bodies. Children and very young people are still in the process of building up their bodies and adding substance to them. But it should not be so to the same extent with adults. Once

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a body has reached its full development, it needs less food to keep it going and to replace worn-out cells. Of course this reasoning does not apply so much to men and women who physically work hard every day. Their food is more like so much coal or gasoline for hard-worked engines and is needed for actual fuel to keep the engines going at that rate.

Custom, however, has pretty generally decreed three "square" meals a day, from childhood to old age, and people have got into the habit of demanding that much every day. But the custom and habit do not necessarily give a true index of the bodily needs of adults who do not have to do hard physical labor. Already some thoughtful people are experimenting to find out just about what their bodies physiologically need to keep them at par.

From our review of the scientific studies of the ductless glands it is evident that when those glands are daily overworked by excess of food they eventually begin to wear out. If therefore most of us eat more every day than our bodies need—allowing a small margin on the safe side—it of course follows that we must be overworking our precious ductless glands, our very centers of life, and hastening their deterioration.

While this question is still somewhat unsettled, it would be as well for those who deliberately try to stave off middle age to give this thought serious consideration, and, without depriving themselves, to try to find out the amounts of food they actually need, rather than

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blindly to follow the bell-wether of custom as to what their diet should weigh and measure up to.

A fact that is strongly suggestive that too much food is generally taken is that premature aging often occurs in those whose occupations are sedentary, and who, by their frequent spells of indigestion and constipation, prove that they eat more than they can digest, and perhaps drink too much also.

Summary. A diet planned to combat the encroachments of middle age should, first of all, cut out meat—certainly the heavy meats. Yet if people firmly believe that they cannot live without meat, probably *they* cannot, with such a subconscious fixation. White meat is always better than red meat, and fish better than either. All sea-fish have traces of iodine, which is a further item in favor of fish. The best diet is one of vegetables, balanced with eggs, cheese, milk, and buttermilk. Butter is the best fat, and olive-oil is of course excellent. Yogurt milk, or Bulgarian ferment in tablet form, should be taken daily; also fresh fruits and abundance of water.

CHAPTER XV

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After surveying the work already done by many scientists who are studying the causes of aging, after comparing and testing it with collateral work in other lines which indirectly bear on old-age causation, and especially after reading the record of *human* results already accomplished, we believe that it appears to be settled (1) that the average human age limit has more than doubled in the last thousand years, (2) that the increasing age limit is due mostly to improvement in environment, (3) that the causes of aging are mostly known, and known to be preventable, (4) that rejuvenation to some extent after age has set in is now possible, (5) that the onset of senile changes may be indefinitely deferred, and (6) that these results can be reached in more than one way.

The Missouri attitude of mind toward new discoveries is on the whole the sane one, particularly on such a vital subject as rejuvenation. But it seems to us that we have now actually been shown and that further incredulity is reactionary and negativistic. Even if the results now attained should prove to be only tempor-

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ary, that would not alter the facts themselves nor take from them their real value.

Speaking of temporary results, not even the most optimistic specialist in senescence dreams of putting ultimate old age and death out of our reckoning. Consequently even the longest rejuvenation could never be more than temporary. But the "temporary" duration may eventually measure up to hundreds of years, even to attaining once more the traditional ages of some of our antediluvian ancestors—"antediluvian" probably signifying the period before the submergence of the vast Atlantic island mentioned by Plato, and before the resultant and cataclysmic tidal-wave felt in many parts of the earth.

One thing that is likely to strike us as somewhat confusing is the great amount of constructive work already accomplished and the variety of the methods that have been used. How is any one to make an intelligent choice of a method in a particular case, whether for prevention of senile developments or for attempted rejuvenation? That is what we are trying to do in this book: to make a digest of what has been done and what can be done at present, and then to set forth in non-technical language outlines of methods that will be clear to intelligent readers who wish to join those who have decided to resist the accepted decree of fate as stated in the ninetieth Psalm.

In the course of Lorand's intensely interesting book, "Old Age Deferred," he mentions repeated instances of

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the rejuvenating effects of certain courses of diet and of drug treatment, not only on middle-aged people, but also on those of advanced age, in whom senility had proceeded far.

The evidence for surgical rejuvenation, according to Lydston, Steinach, and Voronoff, seems to be even more than promising; almost established indeed. But these surgeon specialists have not yet, so far as I know, committed themselves as to how long their marvelous surgical rejuvenations are likely to last.

And yet Lorand, in his preface, warns us very finally that those who hope to transform age into sprightly and effervescent youth will be disappointed; that the most that can be expected, in the present state of knowledge, will be to prolong our useful period of life ten or twenty years. The impression one gets after comparing his preface with the body of his book is that he secretly believes that by applying the knowledge already on hand considerably more than twenty years may be added to one's useful life, but that the realization is too startling and epoch-making to be safely stated in so many words at the present time; and for that reason he applies the brakes in his preface.

However that may be, I prefer to judge Lorand by his facts rather than by his cautious preface, and the most significant of his facts are the many instances of those whose prolonged youth has far exceeded twenty years. The past records of science are full of facts which prove that the limitations of one period become

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the attainments of later ones. In psychology in particular we have shown that the worst restraints to world progress are the mental limitations set up by precedent, convention, habit, and lack of imagination.

In regard to the subject of aging, psychology is one of the determining factors. If a person makes up his mind that old age is inevitable, no treatment—dietetic, medical, or surgical—will have much effect in delaying the onset of the confidently expected signs of senility. Therefore, and in strictest accord with the known principles of psychology, it is a psychological mistake for Lorand to assert so categorically in his preface a time limit beyond which senility cannot be held back. Such an expression of opinion, from one who occupies his authoritative position on old age and its prevention, will be accepted by many as a decree from which there can be no appeal. It will establish subconscious fixations fully as limiting among intelligent readers as the ninetieth Psalm has been and still is for millions of unthinking persons. In psychology we find more and more that *"limitation is the belief in limitation."* Hence the unquestioning expectation of the climacteric at forty-five is the practical assurance of its arrival then. Likewise the expectation of senile debility at three score and ten means the certainty of it at that time.

In various parts of this book we have reiterated and dwelt on the ultimate serious effects of sustained negative beliefs on our bodies. I shall now go still further and say that we should not accept *any* limitations,

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physical or mental, based on the conclusions of even the best authorities. We should certainly *not* senselessly affirm, as some do, that disease, old age, the climacteric, and death and taxes are illusions. But we should not accept the conclusion, because all those misfortunes have happened to others and probably will happen to most people, that necessarily they must happen to *ourselves*. When Thomas Troward said, "The only limitation is the belief in limitation," he summed up the potentialities of the subconscious mind. Remember that we who are now studying the causes of aging have found out many things about which other people did not and do not yet know, and that we are therefore able to some extent to adapt ourselves to nature's *constructive* processes and rhythms, and to avoid those negative phases which are destructive in their effects.

To some extent, therefore, to believe in and to accept a limit in any direction, just because it has hitherto happened to be the limit for most other people, is to admit our ignorance. Nature is eternal. We are parts of nature and therefore must be potentially eternal. Each one of us is potentially *all nature* focused and concentrated into one individual. When we are ignorant of natural laws our bodies drift and meet wear and tear and at last break up. When we begin to learn the laws of our existence, we can more and more protect our bodies from wear and tear, and therefore more and more prolong our individual lives.

All this, please note, is no longer mere optimistic

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theory or mental suggestion but known fact. The changing age limit alone proves that. And now I shall give a sample of "authoritative" opinion on old age and shall ask that you carefully note your reaction to it—*before* reading what will follow.

Stanley Hall, in his masterly work, "Senescence," tells us :

Robert Saunby, M.D., has given us what is, to date, the best handbook, both for practitioners and for old people who are intelligently interested in conserving their life and strength, on the common infirmities and care of the aged, *exclusive, for the most part, of nervous and psychic symptoms.*

The italics are mine because I want them to be especially remembered. After summarizing the scope of the book, Doctor Hall then concludes his remarks on it as follows :

No one can read his account of the changes that take place in each part and organ of the body as they are successively described and the very different treatments that each needs as it goes wrong, without a sense of the fatality with which these vast cohorts of life-quelling symptoms advance and, in view of the many strategies the lethal processes make use of to undermine the fortress of life, without experiencing a profound sense of the hopelessness of watching out in so many directions and realizing that, as differentiation proceeds in the different organs, any regimen helpful to one would almost certainly be harmful to others.

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Well! How do you feel now? Depressed, of course, if you are over fifty; hopeless if over sixty; and if seventy or more you will feel like looking over the latest list of Fall styles in tombstones. What intelligent person would not so react, after such a damning summing up of the generally accepted conclusions of eminent medical authority, though apparently of the school of thought which still regards our bodies, in the main, as chemical retorts and complex mechanisms? The direst negative suggestion of them all is contained in the last words, which assert that whatever helps one gland or organ injures the others.

The first thing to do is to take the meaning out of those last words, and the way to do that is to cite facts which prove the contrary. Remember, first, that a pound of fact is worth more than a ton of theory. Secondly, against the statement that whatever helps one organ injures others, put in parallel columns the three Steinach cases summarized in Chapter V; Lorand's results with thyroid extract; the case of retained youth at seventy-five by reason of arsenic, described in Chapter IV; and the case of Sanford Bennett, described in Chapter I. The Steinach operation conserved all the secretions of one set of glands, and in doing so did not further injure the depreciated thyroids but obviously must have helped to revivify them. On the other hand, Lorand's successful treatment with thyroid extract did not injure but apparently revived the jaded sex glands. The arsenic case may have owed its results

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to thyroid stimulation, in view of Sajous' statement that the thyroid gland normally contains arsenic and therefore requires a certain amount. But whatever the arsenic did it could not have injured either the sexual or adrenal glands, but must have helped to put them and all the other glands in excellent functioning condition—which is all that matters to us. The case of Sanford Bennett is perhaps the best antidote of all to "the profound sense of hopelessness of watching out in so many directions," for it is the clearest possible demonstration of the needlessness of "watching out" in any direction but one: just plain, sane, physical exercise; exercise alone, which arrested the course of senility in an already senile man, revived *every* internal glandular organ, obliterated the senile wrinkles, baldness, chronic dyspepsia, and chronic rheumatism, and, twenty-two years later at the age of seventy-two, gave the muscular development, vigor, and facial appearance of an athlete of about forty-five.

So much for *physical* facts that contradict the assumption that treatment which helps one organ hurts others. And now for another set of facts to help neutralize this large dose of gloom.

If you will look back to the last quoted paragraph but one, you will see that I italicized its last ten words. You probably forgot that while reading the last depressing quotation. But those blessed ten words put everything in a new light, and should take the sting

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out of Dr. Saunby's excellent and depressing handbook on old age.

The book deals "for the most part" with *bodies*, physically, chemically, and physiologically, but not psychologically. In so far as it goes it is doubtless complete, and quite accurate for all who believe in heredity, in old age as divine dispensation, and in Psalm 90:10. But having left out psychology it has left out at least half of the subject. For our purposes it is therefore incomplete, and the gloomy first impression its reading gave to Dr. Hall need trouble us no further. Without having read the book, and judging entirely from the hopeless impression it made on Dr. Hall, I cannot agree with him that it, or any other book on that subject which leaves out psychology, is the best handbook for physicians and intelligent elderly people; and I shall support my opinion by his own words from another part of his book:

Senescence is, in no small degree, a state of mind as well as a state of body, and the study of it as such has been so far strangely neglected but is now in order.

Furthermore Dr. Hall holds that while the common belief that heredity is the chief factor in longevity is correct in general, it is fatalistic and lessens confidence in scientific methods for prolonging life. There are now many exceptions to the so-called law, and correct rules of living can undoubtedly give us longer life than our forefathers had. The psychological effect of the

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heredity theory is depressing and may become dangerous or fatal to those who have marked the ages where their fathers died. Indeed, he says, one of his chief purposes is to show that the old-age problem is *chiefly psychological*. He further believes that the future welfare of the race depends on an old age that will be the result of better knowledge and control of the conditions of this state of life.

Facing Ourselves Up. To those who are already old when they seriously take up the study of senility in the hope that they may learn how to check for a time the advance of senile changes, much help can be found in a psychological process which is in effect a kind of mental and emotional catharsis. But the process is repugnant to most of us, and takes more will-power than is the rule. In a few words, this purging process is to face the actual facts in one's own personal case, and not to camouflage them by attractive disguises which deceive no one but one's self. For example, some writers tell us that we are only as old as we think we feel, and that old age is really beautiful! Many old and aging people catch at such last straws of deceptive hope and try to believe in them. But no one else believes them. The only constructive thing to do, and the only thing with any hope in it at all, is to reject such folderol entirely and to face the facts in our own *mirrors*. The cold brutal facts are (1) that we are certainly not so old as we say we feel, but as old as we *look*; and (2) that old age is seldom or never

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beautiful, and generally the contrary. It takes much real courage and some bitter moments to take stock of one's depreciated equipment in that way; but after it is over, there comes a sense of real relief and freedom from limitation—a true Freudian relief. Stanley Hall tells us frankly and in detail how he faced up the facts of his own advanced age, and in doing this he shows a greatness of soul and degree of self-mastery that is perhaps without precedent in literature.

Another thing he did, and with many a wrench and pang, was to burn up vast quantities of old letters and old manuscripts that he had accumulated during forty years. By getting rid of all that old truck he ruthlessly cut himself off from his past—in the limiting sense, that is, of clinging to a past on account of the reminiscences of a youth and activity passed and done with forever. Dr. Hall's renunciation in thus burning the bridges of his past and youth is the more impressive in that he does not appear to have the support and comfort of a belief in personal immortality.

Next he read everything and every book that had been written on aging and senility, and then in his own great book he brought together into one volume for easy reference a mass of facts and traditions that a student could otherwise only find in hundreds of books and periodicals in several languages. Thus we see that Dr. Hall, by sternly facing up the fact of his own age, and by even more sternly cutting loose from all the limiting memories and souvenirs of his vanished youth,

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has built on the foundation of his own new state of life a monumental work which will be of great value to students and investigators for many years to come, and which is likely to remain unique in the literature of psychology.

The great lesson in this for all of us lesser mortals is : (1) to resolutely face ourselves up, to see ourselves as we really are, and—as a matter of humiliating fact—*as others see us!* (2) to assemble such equipment as we have have left, and then study how we can use it to to the best advantage to others and to ourselves. For after all, the merely selfish desire to prolong life and youth, or to regain youth, is sterile unless it has a bigger objective than one's self. Gertrude Atherton's heroine devoted her renewed youth and strength and beauty and fortune to the relief of human suffering. One with such a motive would be more likely to gain something practical and tangible from the study of the prolongation of life and youth than others whose main idea was the renewal of the sensuous pleasures of youth. Strange as it may seem to many from Missouri, the only true and lasting gain in life comes not from grasping but from giving. The reasons for this go deep down into the psychology of the self.

Medicine and Specialties. Within recent years the accumulation of medical and surgical knowledge has become so great that only a few super-minds could master all of it, and even they not thoroughly. The inevitable consequence has been that medicine and sur-

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gery have been broken up into a number of specialties. When a man devotes all his time to one specialty—say, nose and throat—he naturally will soon know a great deal more about that subject than other doctors who generalize. At the same time, however, he will be likely to neglect other branches of medicine and surgery, and it could not be otherwise.

Through the work of Metchnikoff, Brown-Séquard, Lydston, Steinach, Voronoff, Lorand, Saunby, Stanley Hall, and many others in the last twenty or thirty years, a vast amount of special knowledge has been gathered on the subject of aging, its causes, prevention, and even treatment. This block of knowledge is now so large that general practitioners and specialists on other subjects cannot be expected to master it. Therefore the time has now arrived for a new specialty—old age, or senility—perhaps better still, senescence, for the first two have a somewhat repellent connotation.

While reading Stanley Hall's book it is borne in on one with increasing force that the most splendid developments of an evolving world are its cultivated, matured, and disciplined minds; and then comes an extreme regret that this efflorescence of world experience must in every instance be so soon cut off. As a rule such minds are only found in relatively few of the aged or aging. Only time can so train minds, and by the time a person has reached that stage of training, he is nearly always old; he has a perfected mind and disciplined emotions in a nearly worn-out

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body, a body that will work with diminishing efficiency for a few years longer, and then have to be scrapped as human junk.

It is not exaggeration to say that the life of an Edison, a Burbank, a Pasteur, a Wagner, a Senn, a Helmholtz, a Roosevelt, a Stanley Hall, or a Henry Ford is worth more to the world than one hundred thousand commonplace lives. Think what it would mean if such men could "come back," if their worn-out bodies could be rejuvenated so as again to be efficient instruments for the creative powers of their god-like minds! Or better still, if preventive medicine could protect their bodies from developing the senile changes that come from the hostile influences of time and environment—even if only for another twenty or thirty years!

There are now in the world a few self-made specialists in this field. Others will learn from them, and in time we shall have a recognized specialty of senescence. And what better sort of world service could there be than to help prolong the lives of its most cultivated and creative minds? Most of us have been in the habit of regarding babies as more important than old people—and quite rightly, as ordinary untrained and selfish old age goes. But there is really no comparison between an undeveloped child and a highly trained and matured man or woman. It will usually take the child a lifetime of painful effort and devastating mistakes to reach that point—and in its turn to find itself in a body that is wearing out. I repeat, there is no nobler

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quest than to find means to defer the onset of bodily senile changes, and to prolong more and more the lives of those who have learned life's lessons, and who therefore would be the most competent to lead the world quickly and surely into a glorious future.

An interesting article appeared in the "Dearborn Independent" for March 14, 1925, by Allan L. Benson, entitled: "Edison Sees the 200-Year Old Man." It comes as an unexpected contribution to the subject, and as a strong support to some of the advanced positions taken in this book. The article also indicates that Mr. Edison is not only an electrician but a physiologist and psychologist. Any opinions he might care to express on any subject would be worth serious attention, for he is one of those who have *done* things rather than talk or write. This is what Mr. Benson quotes him as saying:

Life is now balanced against environment. On one side of the scale is our vitality. On the other side are the hostile features of our environment. These hostile features are always trying to kill us. Sooner or later they succeed. They will not always, however, be permitted to succeed. Man will intervene in his own behalf. He is already intervening. He is improving his environment. Just to the extent that he is improving it, he is increasing the duration of his life. He will continue to improve it until he will live with what might be called the minimum of resistance. When that time comes he will live long. I do not place the limit at two hundred years.

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I think the average human being will eventually live more than two centuries.

Commenting on this, Mr. Benson says :

Edison, in all his long life, never before said anything so important as that. Multiply the average of human life almost by four and nobody now living would know this world. The most tremendous changes in our habits, customs, and thoughts would probably follow. Beside such a world, our present earth would seem very poor and very miserable.

When Mr. Edison was asked what he considered the most hostile feature of the average human being's environment, he instantly replied :

His lower bowel. The average human being is a traveling poison factory. It is inevitable that the poisons should be made, but they should not be carried around. What is kept inside is absorbed and put into the blood stream. Poisons tear down the tissue and give rise to a great variety of diseases. Get rid of it and we shall live much longer and be more comfortable. And it is possible to end autointoxication. It is all a matter of diet and lubrication.

We agree with Mr. Benson that these definite statements are profoundly important and significant for the immediate future. We may indeed begin to be optimistic of a not far distant golden age of prolonged youth, energy, and accomplishment, when the great

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Edison, with his wide vision and divinely creative imagination and incredible past record of work done, turns his attention to the task of preventing old age. Our only regret is that he did not do so thirty years ago. Every word that he is quoted as saying is in line with the latest studies made in this subject by others.

It may occur to some to discount Edison's opinions in this field because he is not a doctor. To smash such a position we have only to mention one well known man whose name is a household word—Pasteur! He was not a doctor and had no degrees from any college when he startled the world with his discoveries in bacteriology which have added so much to human happiness and so materially raised the age limit.

"One of the most serious drawbacks to human existence as we now know it," says Mr. Benson in the course of his article, "is its exceeding brevity. We spend the first thirty or forty years of our lives learning how to do something, only to discover that we have not much time left in which to do it. Death is largely a matter of putting experts out of business. An occasional man, as in the case of Edison, lasts a long time, but the average human being has at birth a present expectancy of only fifty-five years."

If since the Dark Ages the average of human life has already risen from twenty-one to fifty-five years among the masses who do not think intelligently about this or anything else but merely gain in age as their general environment improves, then what may not lie before

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those of us who are studying this question scientifically and already understand the chief causes that bring about senility, and moreover know that they are preventable with our present armamentarium?

"True science can accomplish a great deal," said Paracelsus. "The Eternal Wisdom of the existence of all things is without a time, without a beginning, and without an end. Things that are considered now to be impossible will be accomplished. That which was unexpected will in future prove to be true, and that which is looked upon as superstition in one century will be the basis for the approved science of the next." And that was written three hundred years ago!

Conclusions. 1. We have come, step by step, through one cold scientific fact after another, to the practical certainty that the ultimate causes of the tissue changes of senility are broadly only two, the first being neglect of the common-sense laws of bodily health; and the second, which is at least as important, bad habits of thought, feeling, and emotion, and negative beliefs impressed in the subconscious mind.

2. The foregoing being true, it follows that aging is not a natural physiological stage of human life but a pathological development. In so many words: *Aging is a chronic disease, and its cause a combination of bad habits.*

3. If people firmly believe that aging cannot be avoided or deferred, they so impress their subconscious minds that *they will do as they are told*, and will blindly

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work toward the first physical signs of old age sometime about middle life.

4. There being at the present time no other known causes for senility than those already enumerated, it would appear to be a logical and almost mathematical deduction that if our bodies were protected from accidents, chronic infections, constipation, and other physical errors of living, and from habitual morbid emotional moods and negative beliefs, *our bodies would not grow old.*

CHAPTER XVI

TREATMENT

This chapter will first recapitulate some of the vital points that should always be remembered; next, outline systems of preventive treatment for those who have reached or are approaching the dreaded period of middle age; and, lastly, outline treatment for others who have crossed that Rubicon of life.

1. Aging is a chronic disease, and its cause a combination of bad habits.

2. The deadliest enemies of youth and youthful looks are autointoxication and autosuggestion.

3. If all the glands of internal secretion function well, and if elimination is good, no abnormal increase of connective tissue, or of insoluble deposits, can take place.

4. The beginning of abnormal tissue changes is alteration of the arteries and glands by the poisons of autointoxication, of certain meat extractives, of drug habits (alcohol and tobacco), and of morbid emotional stress.

5. Good elimination will for a time cover a multitude of bad habits. It is due to this fact alone that some

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people live to a robust old age even when addicted to excessive meat eating, alcohol, and tobacco.

6. The mental and emotional attitude toward age causation is a vital factor in treatment.

Sir William Osler said that, barring some half-dozen specifics, the main value in our medicines is the confidence our patients have in their doctors; he said it before glandular therapy had advanced where it now is. But accepting what he said as a principle in medicine and psychology, it is evident that when a patient is receiving treatment for senility or prophylaxis against it, his best possible coöperation is secured when he has intelligent knowledge of the subject and the treatment. While blind faith in a doctor or method will often get surprising results, it cannot be won, as a rule, from educated and intelligent patients. Going further still, it is probable that a hostile attitude toward a remedy given for a demonstrated deficiency—say, of thyroid extract—would partly or wholly prevent any good from the treatment. So we may take it as settled that when we treat patients for senility or its prevention we must have their *faith*, blind or enlightened, in the efficiency of the treatment, if we hope to get any results worth while.

A word of warning should be given to all who decide to take up their own fight against the encroachments of middle age. Do not expect quick results. They may indeed come quickly, but as a rule they cannot be expected to do so. There is a medical axiom to

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the effect that a chronic disease requires a chronic remedy. This is generally in accord with natural order. The swing of a pendulum is the same in both directions. Any obvious senile changes have taken years to develop. It may take years to get rid of them or improve them. Indeed a very rapid process of rejuvenation might be a severe and dangerous strain on one's tissues, and also might not be lasting. The only reasonable and safe way to go about any method of rejuvenation is to make it a part of one's new daily routine—the acquiring of new and more wholesome and *scientific* habits of living, not for a few weeks or months, but indefinitely. In this way one's gain will be slow, but also surer, and it will be likely to last much longer.

Prevention. The treatment of aging, as of all other diseases, consists of preventive measures before signs of senility have appeared, and of treatment of middle age and old age. Preventive treatment applies of course to those who are not yet old, who are what is called middle-aged or approaching middle age, and who have already noticed some warning of signs of senility just around the corner. Examples would be men from forty-five to fifty, and women from thirty-eight to forty. Rational treatment consists both of *general* treatment, which applies to all in this class of near-middle-aged people, and of *special* treatment, which differs for individual cases.

General Treatment. This consists broadly of four divisions, or, rather, comes under four heads; namely,

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(1) diet, (2) exercise, (3) elimination, (4) psychology.

Diet. First as to quantity. Most of us eat too much and have accustomed our bodies to wasteful habits. Eat less than you want at meal-times rather than more. Experiment and find out what amount you can live on and be at your best. Drink plenty of water, but not ice-water—certainly not during meals. The amount of sugar is an important consideration. In recent years there has been a tendency to eat far too much sugar, and, worse still, white sugar which has been denatured in the refining process. Whitened cane-sugar is *sweeter* than brown sugar, as any one can prove by testing with black coffee, but that is hardly a recommendation for it. Brown sugar is better sugar because it is natural sugar, but, being brown instead of white, it is not popular for table use. Excessive sugar in the diet is in a mild way like alcohol; it impedes digestion and puts extra strain on the liver.

Salt is often taken in too large amounts. It then tends to check the secretion of the kidneys. Consequently it is forbidden in all cases of kidney disease. Many people at about middle age are bordering on nephritis on account of previous meat eating and lack of exercise and deficient elimination. Therefore it is well to cut down considerably on salt when beginning to take one's self in hand toward middle age.

Next as to *quality* in diet, and the first consideration will naturally be, what *not* to eat. Do not eat *meat*. The scientific arraignment against meat has been set

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forth in the chapter devoted to diet. If, however, you have a fixation which makes you believe that you feel exhausted if you do not eat meat, then eat the white meats or fish; preferably fish, and still more preferably sea-fish, on account of its iodine content. It should be remembered, however, that although fish as a rule lacks poisonous extractives, it makes a very rapid culture medium for putrefactive bacteria, even more so than meat. Consequently when fish is eaten special care should be taken to avoid constipation.

Buttermilk is also a very good and wholesome food. To some extent it has the properties of yogurt, which reduce intestinal putrefaction and constipation. The characteristics of buttermilk seem to depend mostly on the presence of lactic acid fermentation. A form of buttermilk made by acidophilus fermentation is now on the market. However excellent buttermilk may be, it has not yet made for itself such a reputation for holding back middle age as has yogurt. Therefore try to get the genuine Bulgarian ferment and use in the same way. It is most convenient in the tablet form, and I have seen it apparently relieve constipation and intestinal putrefaction in several cases.

Eggs and cheeses are abundant and usually unobjectionable sources of albuminous or proteid material, and in a vegetable diet they can entirely replace meat. But where eggs are frequently eaten it is specially necessary every day to have free bowel movements. The reason for this is that eggs, being very concentrated and with-

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out residue or ash, are likely to constipate; and then, as a matter of course, they increase intestinal putrefaction and acid formation within the body. An injudicious and excessive diet of eggs would therefore defeat its own object and would be almost as bad as meat.

Then as to milk. Remember the example of Parr, who lived mostly on milk and dairy products all his life, and looked like forty-five when 152. Therefore drink plenty of milk, raw milk if you can get it. Get some genuine yogurt Bulgarian ferment, and take yogurt *every day*. Remember that the marvelous age record of Bulgaria seems to be largely, if not wholly, due to yogurt.

For bread, use whole-wheat or rye bread. By whole-wheat bread is not meant the flimsy stuff usually sold in bakeries as such. That is mostly denatured white flour with just a dash of the real wheat. If you do not live at home it may be impracticable for you to find any whole-wheat bread that deserves the name. In that case use either dark rye bread or pumpernickel or rye-krisp, an excellent kind of hard bread which originated in Sweden and comes in wide flat disks about like ten-inch phonograph records.

As to vegetables, eat almost any that you like. Their special properties have been mentioned in the chapter on diet. If you do not feel strong, and look pale or anemic, it means that your body needs more iron; and therefore remember that some vegetables contain more iron than others, especially spinach, lettuce, tomatoes,

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carrots, and artichokes. As has been said before, the indigestible fibrous parts of vegetables are excellent as mechanical stimulants to contraction of the intestines and daily movements. That is why bran has such a reputation for overcoming constipation.

All the natural cereals have good all-around food values, but it is probable that many or most of those that are put out as breakfast foods have lost some of their original values in vitamins and mineral salts in the processes of preparation for quick cooking.

Fresh fruits are among the most valuable things in the diet of those who desire to live and enjoy life beyond the respectable three score and ten. They should be taken daily and in plenty. They help to maintain the normal alkalinity of the blood and to bring about natural and regular evacuations. Another valuable point about fruits is that virtually all of them have sugar in the form of levulose, a natural fruit sugar which is more assimilable than white cane-sugar and can even be taken by people who have diabetes.

Water. More than once I have advised drinking plenty of water. The matter is so important, however, and so many people have somehow got into a habit of drinking very little, that it will not be amiss to devote a page or two entirely to water.

It is an actual fact that almost everything we eat consists mostly of water, plus more or less of other things. To take a few examples: Eggs have about 65 per cent of water; fresh beef, 52 per cent; pork,

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48 per cent; fowls, 47 per cent; halibut, 61 per cent; milk, 87 per cent; white bread, 35 per cent; shelled peas, 74 per cent; shelled Lima beans, 68 per cent; and so on.

Again as to medicines. All medicines are mostly water, or have to be given with relatively large amounts of water. From the point of view of volume all medicines are just water, plus a very little of this or that mineral or chemical or vegetable extract.

The human body itself consists of water for the most part. "Water constitutes about three-fourths of living substance. The remaining portion of it being composed of inorganic and organic material."¹ Obviously, then, if any one substance can be said to be most essential to life, that substance is water. The spectacular Irish hunger-strikers of some years ago demonstrated that the body can be kept alive for more than two months on nothing but water.

Besides its chemical and mechanical functions, water has several *physical* functions of paramount importance. To mention a few of them, it makes up the bulk of the digestive fluids; it makes the blood more fluid so that it will flow more easily and carry nourishment into every microscopic capillary and to every deep cell in the body; it dissolves and carries to the kidneys and skin the waste-products of nutrition, which become poisons or age-producing deposits if not got rid of soon after their formation.

¹ Burton-Opitz, "A Text-Book of Physiology."

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It is a good plan to drink two or three glasses of water every morning on rising. With meals a moderate amount is good, but if too much is taken it dilutes the saliva so that it cannot do its appointed work in the stomach as thoroughly as it should before the acid gastric juice takes its place.

Summing all this up, it must be obvious that health, strength, the prevention of premature old looks, and life itself depend to a great extent on the amount of water daily taken into the body.

In conclusion, it should be remembered that the remarks in this chapter only outline the more important points. There are many very good up-to-date books which cover the whole subject. After one has taken up his or her fight in earnest against aging, much help may be obtained from a deeper study of diet. Looked at in one way, diet is our most important consideration, for our bodies themselves are the quintessence of the substances we eat. And yet, when looked at in another way, diet should not require very much thought. If we could always live under sane and natural conditions, and had not acquired capricious tastes, and were not under the great delusion of meat, our diet would instinctively be simple, nutritious, and harmless. Normally our choice in diet should not require any scientific knowledge as to food values, vitamins, calories, and the like. It would be a mere matter of healthy appetite and sound sense. But most of us do not live under natural conditions. Unwholesome en-

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vironment, sedentary employment, and lack of exercise have perverted our normal food instincts. Our meals are often decidedly unbalanced. Our grain foods are commercially and ruthlessly denatured. We eat meat to excess. We are victims of worry and of false beliefs. Having thus lost our natural instincts and sound sense about food, we have come to an *impasse* which can be relieved only by scientific knowledge. Our lost dietary sense has to be learned all over again in scientific laboratories.

Elimination. This is one of the first necessities for all who seriously think of prolonging youth and usefulness. The best elimination is that which can be got naturally, through correct diet and exercise. Enough fresh fruits usually take care of it efficiently, but not always. Vegetable diet generally tends to induce free and regular bowel movements on account of the large amounts of fiber or cellulose it contains. Meat, eggs, and milk alone, or with little other food, always tend to constipate, because they leave little or no residue. So even milk diet needs fruits and vegetables to give the necessary stimulus to the intestinal muscles to contract and expel.

If in spite of exercise and fresh fruits and plenty of water there are not free daily evacuations, then emergency relief must be got from medicines. Cascara is a good mild laxative for most people, but it is slow. If taken at bedtime it usually acts in the morning. Sometimes a quicker medicine is more desirable. A Seidlitz

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powder, sodium phosphate, or a saline like Pluto water will act within one or two hours if taken when rising in the morning. Laxatives or salines should not be taken every day, however, but only every few days; say, once or twice a week. In this way and by daily efforts at the same hour the constipation habit can sooner or later be broken. The amount of retained material evacuated is often surprising to one who is somewhat constipated, or who seems to have had fair daily movements.

The best outward and visible sign of an inward and sizzling corruption is seen when a hearty meat-eater happens to take a purge. He may previously have had what he regarded as daily evacuations, but the persistence of a coated tongue or a bad breath has induced him to try a spring cleaning out. He is amazed at the quantities of reeking rottenness that erupt forth, and wonders how they could possibly have accumulated.

Dr. Josephine Jackson, in "Outwitting Our Nerves," gives very sensible advice on chronic constipation which any one so afflicted would do well to test before resorting to more drastic methods. She believes that "constipation is wholly due to the acceptance of a false suggestion," and therefore "the only logical cure must be release from the power of that suggestion." She cites a number of cases of chronic constipation that she has cured in a few days merely by ridding them of their false suggestions. She believes further that "constipation is an inhibition or restraint of function, but is

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never a *loss* of function." She advises that the first and all-important practical step in overcoming chronic constipation is "the *conviction* of the integrity of our physical machines and a determination not to interfere by thought or by physical meddling with the elemental functions of our bodies." Having acquired this essential conviction, she advises choosing a regular time every day and keeping the appointment with one's self, for the reason that all nature's processes go in regular rhythms. Time should be taken to acquire the new habit. There should be no straining, which does no good whatever, and may even inhibit. If no results come within three days, small enemas will help to start normal movements. But "once you get the right *idea*," she says in conclusion, "all enemas will be superfluous."

The skin should be helped to do its part in elimination by frequent bathing. Hot baths are good, soaking in the tub fifteen or twenty minutes at a time. Lorand recommends steam-baths every now and then. One may bathe daily, and yet be surprised at the amount of dirt that a steam-beath will sometimes get out of one's skin.

Physical Exercise. We return now to what we believe to be far and away the best, surest, safest, pleasantest, and cheapest method in every way for the prevention and cure of middle age; the method which is suitable and available to the very large majority—physical exercise. There are various methods of physical exercise, and any or all of them will lead to the

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same goal if health and physique can stand them and if *practised regularly*. The fact is, however, that the very people who are most in need of exercise are just those whose previous ways of living have so habituated them to physical inertia that the mere thought of exercise appals them. If they do begin it, they tire so quickly and find it so intolerably irksome that they usually give it up before having really commenced it, as something altogether too strenuous "at their time of life." Their doctors often advise against physical exercise—again "at their time of life"—on account of possible danger of heart strain. And indeed this is often true of the ordinary gymnasium exercises. Consequently when we advise physical exercise as a prophylactic against middle age, or for its cure, we must always consider the lifelong habits of our patients and their resultant psychological attitudes toward physical exercise. We must never forget that persons who have led sedentary and inert lives will almost never have the will-power to continue for more than a few days any strenuous or fatiguing system of physical exercise we may thoughtlessly prescribe for them. And knowing this, we must select for them a system that will come easily and not stir up their lifelong subconscious fixation against bodily exertion.

Fortunately we have such an ideal system in the one devised by Sanford Bennett, "the man who grew young at seventy." Here is what he calls "a lazy man's system," but for all that a complete system of

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some thirty exercises which develop every muscle in the body, and *every exercise taken in bed*. There is at no time any strain on the heart, and there is no disagreeable fatigue. The exercises range in scope from those which develop the biceps to others which obliterate wrinkles and double chins. They take from half an hour to one hour every morning before rising. No mechanical apparatus is used, and there are no heavy physical strains.

The astonishing results obtained from this system in bed would be beyond belief, were it not for the living demonstration in the person of the rejuvenated Bennett himself. Since his book appeared thirteen years ago, many others have followed his lead.

One of the most significant things about this system is that (1) the same athletic development is attained as that got by violent straining and lifting exercises; and (2) general improvement and rejuvenation of all glands and organs takes place without medicines and without special attention to diet.

From these two remarkable results we derive two important and far-reaching conclusions. One is psychological and to the effect that it is not so much the actual movements that develop the muscles but the *fixing of the mind upon them*. The movements and the conscious attention and desire impress the subconscious mind with a tendency in the direction of youth and strength instead of toward aging and debility. And this impression, strengthened by repetition *every day*,

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becomes more and more definite until a constant and positive momentum is generated toward the perpetuation of youth.

The second conclusion is physical, and is that the improved and quickened circulation due to regular exercise brings more blood to all the vital organs and not only nourishes them much better but flushes them with fresh blood and begins to dissolve out and eliminate the ash accumulations of years of previous stagnation.

Among these exercises it is hardly necessary to say that the ones which will appeal most to women are those which fill out hollow cheeks, get rid of double chins and other masses of unsightly fat, and smooth out wrinkles and crow's-feet. Bennett admits that he got most of these cosmetic exercises from the methods of the famous French beauty Ninon de Lenclos, who was still a beauty when she died at the age of ninety. Bennett has shown that flabby cheeks and sagging necks are due to atrophy or wasting of the underlying muscles. He treats these muscles by tensing them and then massaging them with the fingers or the hand below the thumb. For the cheek muscles, assume an exaggerated smile, next drop the lower jaw as far as possible, then massage the cheeks with the muscles stretched. For filling out hollows in the neck, bend the head backward so as to tense the muscles under the chin, then massage with the hands. The same movements are used to get rid of double chins, though this

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may sound like blowing hot and cold with the same breath.

Wrinkles are removed by tensing the skin with two fingers of one hand, and then smoothing them, or, as it were, ironing them out with the thumb and fingers of the other hand.

It would take too much book space to describe each exercise in detail. But Bennett's book is still in print, I believe, and every earnest reader is advised to get it and follow his instructions in the main. His only exercise that I do not approve of is one for massaging and percussing the liver. This might do harm if done too strenuously. Likewise his condemnation of any and all medicines should not be taken too literally. For the great majority of persons who take regular physical exercise I quite agree with him that medicines are without value except in emergencies. But wide experience proves that medicines have a definite place and value for what may be called a normal minority. For example, the positive value of iodine as a medicine in certain cases must be clear to all who have carefully read the chapter on the ductless glands.

Summary as to Physical Exercise. Some kind of regular physical exercise should be taken *daily*. It is not enough to take it once or twice a week—though that is better than none at all. Get the *habit* so that you like it and look forward to it at a certain time every day. If you are so situated that you can have tennis,

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basket-ball, or swimming every day, that will be enough. But otherwise, and if you are at a loss just what exercises to take and find them dull, it will be best to take some lessons from a physical trainer. Exercise is essential for keeping up the circulation and the tone of the arteries. It drives the blood faster through all the tissues, giving them better nourishment and causing better elimination through the skin, lungs, and kidneys. Several magazines now give regular and illustrated courses of physical exercises for indoor use. They are all good, when it is impracticable to get the most interesting and stimulating outdoor exercises. Walking is of course excellent, but it is not enough for the upper part of the body.

Before the World War a Hindu showed me some remarkable physical exercises which he asserted, among other values, would overcome even the most obstinate constipation. They consisted in acquiring independent control of the abdominal muscles on both sides. This has been substantially confirmed recently by Charles Ward Crampton in his book, "Physical Exercises for Daily Use," in which he describes similar exercises and assures us of their value if persisted in.

A New Routine. Such a routine as just outlined will, if environment permits it to be carried out, do wonders by itself. The appetite will improve. Elimination will soon take care of itself. There will be new energy, ambition, interest, improved memory, and an increased feeling of well-being all around. Medical

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treatment is hardly called for; although it can do no harm and perhaps may speed everything up to take small doses of iodine a part of the time. The best way is the common tincture of iodine, three drops daily in about a wine-glass of milk. Stir with a *glass* rod until the yellow of the iodine has disappeared. It is then tasteless and in a form of an albuminate of iodine which is easier to assimilate than the ordinary iodides. Take before breakfast every day for three weeks, stop for a week, then begin all over again. Ordinarily such small doses should do no harm whatever. But occasionally one may be unusually sensitive to iodine or some other drug. If you notice unaccustomed headaches or slight dizziness or stomach disturbance or a metallic taste, then stop the iodine and see if that makes an immediate difference. If it does not, then there is some other cause, probably need of a short course of assisted elimination.

This outline looks simple enough, but it is nothing less than a marked change in the lifelong habits and acquired tendencies of most of us. But this is not all. There are still the psychological steps for disciplining the subconscious and ridding it of its lifelong fixations about time limits for senility, the climacteric, and death.

Psychology. 1. *Convince* yourself by intellectual study that old age is indefinitely preventable. Do not merely believe so because this or any other book says so. *Know* it for yourself.

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2. Having convinced yourself by scientific knowledge that aging is preventable, you are then in a position *intelligently* to reject the universal notion that physical and mental deterioration, the climacteric, and senility are inevitable dispensations.

3. Realize intellectually that man's science and man's will are personal factors in evolution which can and do change the old order of nature from purposeless automatism into lines of definite direction for man's advantage.

4. Realize by study that your subconscious mind governs all bodily functions through the sympathetic nervous system.

5. Convince your intellect that thoughts and feelings of depression, fear, anger, hatred, and revenge impress your subconscious negatively and destructively, disturb the perfect balance of the sympathetic system, and produce the intestinal poisons that slowly and surely cause the signs of old age.

6. Harmonize your subconscious mind by deliberately forming a *habit* of self-confidence and optimism. Repetition of a Coué formula three times daily would help you in this.

7. Knowledge is always power. *Realization* that aging is preventable is *power in itself*—power to transmute one's lifelong and age-old subconscious tendency toward senility into a positive tendency to resist it and remain young indefinitely.

Treatment of First Signs. The treatment just out-

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lined applies to those who are not yet senile but have the near expectancy of senile symptoms. Our next remarks are for others who are about the same in years, but who already show some of the first signs—such as fatness, wrinkles, failing eyesight, grayness, menstrual disturbances, or male climacteric symptoms. For these, all that has been said for the others holds good as to diet, elimination, exercise, and psychology, with the addition of definite *medical treatment*. Iron and arsenic are the first drugs to consider. You can tell whether you need iron or not by two tests. The first test is whether you look pale and feel below par. The second test is easily made with a card on which are five or six squares of red color varying in shade from light red to dark red, corresponding to the colors of blood ranging from fifty or sixty per cent to one hundred per cent, or normal blood color. Each square has a round hole punched in it. The test is made by pricking a finger with a fine needle after washing and drying the finger. Take up the drop of blood with a small piece of thin white plotting-paper. Pass the blotting-paper under the hole in each red square until you find the one nearest its color, which is labeled with the percentage of blood iron it indicates. These cards can be obtained in drug-stores, and are also put out by the large wholesale drug firms to advertise their iron or iron-arsenic preparations. There are several new preparations of iron and arsenic in organic combination which are better than the crude minerals of the old prescriptions. Remember

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what was said in an earlier chapter about the tendency to take too much medicine. Take the smallest dose indicated and keep this up for three weeks, stop a week, and then take again for another three weeks, until your blood color is about ninety per cent. Then discontinue the medicine.

Thyroid extract is the next logical remedy, for we know that fatness and wrinkles are usually plain signs that the thyroid gland is not up to par. Here again remember about *small doses* and medical supervision. Take one tablet with each meal for two or three weeks, rest a week, and begin all over again. Keep this up indefinitely unless you notice any of the signs already given that indicate that too much iodine is being taken. If so, stop the thyroid extract for at least a month, and then begin again. When the fat is reduced and there is marked improvement, stop all medicines but keep up the rest of the daily routine.

In whatever form or dosage iodine may be taken, recent researches indicate that it should be under experienced medical supervision. There are two reasons for this. First, because although all goiters, like all coons, may *look* alike, there are important structural differences in them which are known only to physicians. In certain cases, especially after maturity, iodine acts as a poison and stirs up dangerous over-activity. Secondly, where thyroid action is normal, even a slight excess of iodine, if kept up for some time, may cause a kind of hyperthyroidism without obvious swelling but

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with marked loss of weight, weakness, nervousness, and heart symptoms. C. L. Hartsock of Cleveland has called attention to these dangers in a very instructive and timely article entitled "Iodized Salt in the Prevention of Goiter," in the "Journal of the American Medical Association," May 1, 1926. Hartsock seems to prove that a considerable recent increase in cases of hyperthyroidism (over-activity of the thyroid gland) has followed indiscriminate domestic use of iodized table-salt in diet. Thus we see that although iodine is an absolutely necessary element to life itself, its over-use may turn it into a dangerous and destructive boom-crang.

Hair Restoration. No subject has been more exploited than restoration of hair. There is no doubt, however, that lost hair can be restored—but not by any known lotions, ointments, or so-called hair tonics. The genuine method of treatment is exceedingly simple and includes two things: cleanliness and massaging. Soap and water are the only cleaning agents that are efficient and natural. The head should be shampooed not less than twice a week. Never mind if more hair seems to fall out at first. They are dead hairs that would soon fall out by themselves, and the sooner they go the better. Daily massage of the scalp for five to ten minutes *with the fingers* is the best known stimulant to stagnant hair follicles. I have personally known two elderly officers who produced new and thick crops of hair on heads that had been bald for many years, and by

nothing else but washing and daily massage with their fingers—a treatment they happened to read about in a copy of "Physical Culture." Sanford Bennett had exactly the same experience with his own hair.

While hair certainly *can* be restored by persistent massage of the scalp, the restoration of its original color has not heretofore been so successful by the same method. Bennett, after a good deal of experimenting, does not believe that it can be done to any great extent. Of course the main thing is to get back the hair itself, but if the color is very much desired also, there are two other methods now in use for which much has already been claimed, though both methods are new and, so far, little known. One uses thyroid extract, and the other violet rays. First as to thyroid extract.

One of the most encouraging and thrilling statements made by Lorand is that sometimes in the course of treatment by thyroid extract the hair grows again in places where it had long since fallen out, and, moreover, the new crop may not then be gray but the original color. The meaning of such a result to women, especially on the stage, would be incalculable.

The violet or ultra-violet ray method originated in Austria and has hardly yet got outside of that country. An Austrian doctor informed me that he had seen it restore not only the hair but its original color and sheen. I have no further definite information about this method, but feel that it should be mentioned here so that

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interested readers may know of it and investigate for themselves.

Other glandular extracts to be considered are those of the sexual glands. Lorand tells us that they bring marked benefit to women who have had their ovaries removed. Any symptoms of senility suggest that the sexual as well as the thyroid glands may not be functioning at the normal rate. The ovarian and testicular extracts are safer than thyroid extract, and may be taken when the needs for them are indicated in either sex.

Treatment of Old Age. The treatment of those who are already old requires several special considerations. First as to diet. They do not need much proteid food; very little, in fact. Milk is their ideal food, with vegetables and fruits. Lorand says he has observed many old people improve so obviously after changing to a milk diet that any one could see it. They not only felt better in every way but actually *looked* younger. Yogurt should of course be taken daily.

Old people usually need more iron, because their blood-making organs are depreciated. One of the best iron medicines is a French preparation called Fer Robin. It cannot as a rule be found in drug-stores in this country but can be ordered. It should be taken as directed on the bottle. Arsenic is said not to be necessary or even safe for the aged. Thyroid extract is probably always needed because the thyroid gland is

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always atrophied in age. It should be given in small doses, and as otherwise advised for those of middle age. It may in some cases be well to increase the dosage of thyroid extract, but this remedy is powerful and may become dangerous in inexperienced hands. Therefore it is always safer and better to take it under the supervision of a physician who has had experience in thyroid therapy—and, quite as important, one who has studied the causes of old age and has an open mind toward the modern developments of the subject.

When old age is already upon one, there is then every indication for trying the extracts of the sexual glands. As they are believed to be practically harmless in moderate doses, they can therefore be taken without the prescription of a physician.

In old age exercise except of the mildest kind is dangerous. It should be limited to quiet walks to an extent that does not tire, and to regular breathing exercises.

Surgical Treatment. We come now to surgery, which looms largely in the public mind as a means to rejuvenation. When old age has actually arrived, it is unreasonable to expect the same definite results in improved looks and strength and efficiency from diet and medicines as when younger, though it is claimed that some surprising results sometimes follow. The question of surgical treatment is therefore paramount in the presence of actual senility. As to men, the three cases reported by Steinach and summarized in Chapter

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V, and many others reported elsewhere, if truly stated, would seem to settle all doubt that definite rejuvenating results can be got in that way. Of course we can have no idea as yet how long such results would last, and with them as with all other cases the personal equation would be important. But even if such beneficent effects lasted only for a few years they would be well worth the operation, which is simple and without danger when done by an expert surgeon, and it can be done under a local anesthetic. Moreover only one gland need be operated on, leaving the other as it is, and conserving the possibility of procreation. The Steinach method appeals to me more than gland transplantations, as being merely the accentuation of a natural process.

Transplantation of the sexual glands of persons accidentally killed, or of apes or goats, has been discussed in Chapter V. Contrary as it still is to prevailing medical and surgical opinion, the reports of Lydston and Voronoff, if accurate, seem to establish the fact that such transplantations sometimes live and function. If this is to be accepted as fact, then it is worth seriously considering as actual therapy for senility.

For women who are already old, who have given ovarian extracts a thorough trial, and who wish to try surgery, I can only say that the trustworthy reports I have seen so far are not so definite as for men treated. Still, if the principle works with one sex, why not with the other? The operation corresponding to the Stein-

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ach one for men would necessarily be somewhat more serious for women, as it would require opening the abdomen. However, as to surgery, Voronoff claims that similar effects can be got from careful X-ray stimulation. The whole subject is still so young that it is too soon for any but a surgeon-specialist to give opinions worth listening to.

Risks Worth Taking. In sum, as to surgery, here is my advice to all who are old and have received the maximum benefit from dietary and medical treatment: You are already old and have only a few more years to live anyway, in the ordinary course of human life. The surgical and X-ray methods are almost without danger when done by experts. The published reports seem to indicate the brilliant results have come to *some* cases, if not to many. It seems to me that even if the risks were much more, they would be worth taking. Remaining as you are, you have nothing but senile debility and death before you. If you were operated on you would seem to stand a fair chance of considerable improvement in every way, and probably also some lengthening of your life and usefulness. If the operation is not successful, you will be no worse than before, except for the money paid to the surgeon—but that could be looked upon philosophically as a promising gamble.

Choice of a Surgeon. If you decide on surgery, be extremely careful in your choice of a surgeon. Though these operations are simple—for men anyway at

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present—they are simple *only when done by experienced surgeons*. These are not jobs for the average old family doctors who do a little surgery now and then just to keep their hands in. Even among surgeons there are born surgeons and machine-made surgeons. A man or woman who is not naturally a good mechanic *can never become a safe surgeon*. A bungled Steinach operation would probably seriously injure or even destroy the gland. Lastly, the surgeon chosen should not be skeptical or prejudiced but at the least open-minded, if not an avowed believer in the value of the operation. The psychological reasons for this consideration are quite definite but need not be detailed here.

The Right Complex. As one of the purposes of this book is to plumb the unsounded depths of the psychology of senility, it is fitting that it should end with emphasis on psychological considerations.

Remember that when the subconscious mind is definitely directed toward any purpose, it shows a marvelous selective power and adaptability in gaining its end. For example, in what we may call the senility complex, by early teaching the subconscious has become impressed with the absolute conviction that senility is inevitable at about a certain time of life. The conviction makes the purpose and gives the momentum. The subconscious displays the most diabolic ingenuity and complete knowledge as to the means that will gradually cause degeneration of arteries and glands and undermine the citadel of life. It knows that in-

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testinal autointoxication will do this, but cannot do it without chronic constipation. Therefore, by one means or another, it sooner or later establishes chronic constipation as a habit; and with that habit well started, the end of the purpose is assured.

Reversing the Current. Now when we succeed in *convincing* ourselves by scientific study that aging has causes like other chronic diseases, and that these causes are preventable by means already at hand, what then happens? By this *knowledge* we break up the momentum of the old negative complex of inevitable senility, and substitute for it a new and constructive complex with a momentum in the opposite direction—toward the indefinite conservation of youth, health, efficiency, and looks. In this new complex our subconscious uses the same selective power and adaptability as before, but now to prolong life instead of to shorten it. It knows that it must first of all stop intestinal autointoxication by stopping chronic constipation—and soon does so. With the same selective ingenuity it withdraws from the food just the amounts of iodine, iron, phosphorus, and so on that each organ needs. It *co-operates* with any medical and surgical treatment that is in line with its own new purpose, and puts the medicines exactly where they are needed.

The Applied Principle. As applying in *principle* to disease and health causation, the principle in a nutshell in this: There are two kinds of subconscious complexes, wrong ones and right ones. Wrong com-

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plexes tend to cause diseases; right complexes tend to prevent them. Once we succeed in establishing the right complex against it, any disease must yield. We regard the climacteric and aging as disease symptoms. Hence we apply the same principle to them as we should in the psychological treatment of other diseases.

Negative Momentum. Remember, however, that the negative momentum of the old wrong complex tends to persist for a while after one *knows* that aging is preventable. This is in accord with nature. A train approaching a station shuts off the power long before it arrives, but keeps on going by its acquired momentum, and would even go beyond the station if the brakes were not put on. This is one of the reasons why quick results from treatment should not be expected—though they may come. It will depend on when the old negative momentum can be stopped, and *that* will depend on how strongly one can put on the brakes.

The Great Secret. Ordinary human life after maturity is a steady and losing fight between body and subconscious mind. The body, expressing the universal principle of life, tries to live indefinitely. The subconscious, ordinarily expressing the negative and *timed* autosuggestions of the climacteric, senility, and death, strives always toward those ends—and, ordinarily again, always succeeds.

Nature Unaided Fails. The tendency of all *forms* of life is to wear out under the stresses of environment. All animal lives are types of unaided nature. Man

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alone can adapt nature to his desires and direct it along new lines. Man alone can understand the laws of life—what hinders life and what conserves life. Man can therefore choose between wearing out in the ordinary way of unaided nature, or of aiding and guiding nature so as to avoid the stresses of environment that bring physical wear and tear and senility.

The Effects of Belief. To reiterate in other words: belief in inevitable aging and senility impresses the subconscious to work continuously toward senility through the sympathetic system. Belief in the prevention of senility impresses the subconscious to work continuously for the indefinite prolongation of youth. Belief in inevitable senility impels the subconscious to disturb one function after another in order to bring about senility, as subconsciously self-determined. Belief in prevention of aging impels the subconscious to synchronize all functions in perfect coöperation so as to prevent aging indefinitely. All intercurrent diseases are subconscious attempts to prepare the field for senile changes. If the subconscious were positively impressed with *the will to live* instead of the will to die, and with a conviction of power to succeed, functional disturbances could not come, diseases could not come, senile changes could not come, and youth would last indefinitely. In sum, a firm belief in the prevention of senility would tend to keep the body in perfect health and radiant youth. This is the Great Secret. Know it, believe it, and above all *feel* it. "Practise

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it first in the heart that you may know it truly, for only there can it be real."

The Survival of the Fittest. When the mind orients itself to the realization that aging is preventable, it soon becomes clear that nature will always hold back certain automatic checks that will safeguard the race against such a world calamity as a universal elixir of youth. Once more there will be a survival of the fittest, but this time something more than the Darwinian fittest. The struggle for existence against aging can be successful only for the fittest intellectually and morally as well as physically, and not even for them unless they have far more than average will-power and one-pointedness. The vast majority are as yet too weak-willed, selfish, slaves to appetite, short-sighted, and butterfly-minded to be able to make any serious efforts to confine the grosser physical appetites, passions, and pleasures within healthful limits—not to even suggest the greater self-control of thought and desire necessary for keeping the subconscious harmonized. But for those who are in earnest and have the required will-power, the scientific drive against aging has started and is steadily pushing before it the lines of Age symptoms into an always receding future.

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